THE YEAR-ROUND DAYLIGHT SAVING TIME STUDY

Volume I. Interim Report on The Operation and Effects of Year-Round Daylight Saving Time

A REPORT TO CONGRESS
FROM THE
SECRETARY OF TRANSPORTATION
JUNE 1974

U.S. DEPARTMENT OF TRANSPORTATION
OFFICE OF THE ASSISTANT SECRETARY FOR
POLICY, PLANS AND INTERNATIONAL AFFAIRS
Washington DC 20590

THE SECRETARY OF TRANSPORTATION
WASHINGTON, D.C. 20590

June 28, 1974

Honorable Gerald Ford
President of the Senate
United States Senate
Washington, D. C. 20510

Dear Mr. President:

I am transmitting herewith for the consideration of the Congress the interim report and recommendations on year-round daylight saving time (YRDST), as required by the Emergency Daylight Saving Time Energy Conservation Act of 1973.

The report supports proceeding with the second year of the experiment. It does recommend, however, that the Emergency Daylight Saving Time Energy Conservation Act of 1973 be amended to provide that during the second year of the experiment, the nation observe daylight saving time for eight months of the year and standard time for the remainder, from the last Sunday in October 1974 through the last Sunday in February 1975.

The principal reasons for this recommended course of action are:

- o Probable savings in energy. Electricity savings of approximately one percent occurred during March and April, with coal the predominant fuel saved. Further evaluations of other areas of fuel use such as transportation or heating are not definitive and may disclose additional savings or partially offsetting increases.

- o Elimination of concern regarding school children safety. While there was public apprehension over the safety of children traveling to school on dark mornings, the limited data available for the brief period of last winter's YRDST experience and the unusual travel conditions prevailing at that time do not provide an adequate basis to determine whether the public's apprehension was justified. Sunrises during March and April occur early enough so that this concern about early morning darkness may be eliminated.

- Public preference. A majority of the public, as measured in a March 1974 national opinion poll, prefers daylight saving time from March through October.

- Need for more conclusive data. It is desirable to have another year's experiment to determine better the net effects of daylight saving time and consequent public reactions so as to establish the merits of altering the historical daylight saving time system.

Sincerely,

Claude S. Brinegar

Enclosure

THE SECRETARY OF TRANSPORTATION
WASHINGTON, D.C. 20590

June 28, 1974

Honorable Carl Albert
Speaker of the House
House of Representatives
Washington, D. C. 20515

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Enclosure

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16. Abstract The Emergency Daylight Saving Time Energy Conservation Act of 1973 requires the Secretary of Transportation to submit an interim report to Congress by June 30, 1974 on the operation and effects of the Act.

As a result of the Act, Daylight Saving Time went into effect nationally on January 6, 1974. Exceptions are operative in Arizona, Hawaii, eastern Indiana, Puerto Rico, the Virgin Islands, and American Samoa. Further exemptions will go into effect in October 1974 in portions of Michigan and Idaho. The time zone boundary was shifted in Kentucky.

The analyses of the effects of Year-Round Daylight Saving Time were not conclusive because they could not be reliably separated from other changes occuring simultaneously including fuel availability constraints, speed limit reductions, Sunday gasoline stations closings, etc. However, there were indications of: some electricity savings; slight increase in gasoline use; ambiguous effects on traffic safety and school children safety; adverse effects for some radio stations; and widespread popularity for daylight savings in the summer but not the winter months.

**9. Other organizations (and individuals) within the Department of Transportation who performed parts of this study were: the Federal Highway Administration (Darrell Beschen and Walton J. Page); National Highway Traffic Safety Administration (Reuben M. Harding); Office of Consumer Affairs (Antonia P. Uccello); and the Office of the General Counsel (Robert I. Ross).

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PREFACE

The Emergency Daylight Saving Time Energy Conservation Act of 1973 requires the Secretary of Transportation to submit an interim report to Congress by June 30, 1974 on the operation and effects of the Act.

The Year-Round Daylight Saving Time (YRDST) Study was performed under the direction of the Office of the Assistant Secretary for Policy, Plans and International Affairs. The analyses contained in this interim report are the products of a government-wide team effort.

The YRDST Study produced two volumes:

Volume I: The Interim Report, and
Volume II: The Supporting Studies

A limited number of copies of Volume II are available upon request directly to the Department of Transportation.

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EXECUTIVE SUMMARY

Confronted by the Nation's first prolonged peace-time energy shortage, Congress passed the Emergency Daylight Saving Time Energy Conservation Act of 1973 to provide for daylight saving time on a year round basis for a two year experiment. The intent of the Act was twofold: (1) reduce directly electrical and other energy consumption through time management, and (2) indirectly reduce energy consumption by increasing awareness and involvement on the part of individuals, companies, and public agencies. The time change was instituted on January 6, 1974. The Act also requires the Secretary of Transportation to submit interim and final reports to Congress on the operation and effects of the Act. This is the interim report required by the Act.

Primary responsibility for administration of the Act has been entrusted to the Secretary of Transportation. Section 3 of the Act establishes year-round daylight saving time, authorizes exemptions and realignments of time zone limits, and makes applicable subsections (b) and (c) of section 3 of the Uniform Time Act of 1966, which authorizes the Secretary to seek court enforcement of section 3 of the 1973 Act. Pursuant to the provisions of this section, exemptions from observing YRDST are operative in Arizona, Hawaii, eastern Indiana, Puerto Rico, the Virgin Islands, and American Samoa. Effective in October 1974, the eastern zone portion of Michigan and the mountain zone portion of Idaho will be exempt. Additionally, the time zone limit between the eastern and central zones has been shifted in Kentucky, leaving more of that state in the central time zone.

The findings of this interim report are, for the most part, inconclusive. After the January 6, 1974 DST transition, the effects were so small that they could not in general be reliably separated from effects of other changes occurring at the time. These other changes included fuel availability constraints, speed limit reductions, Sunday gasoline station closings, and voluntary reductions in the use of lighting, heating, and unnecessary travel.

Consequently, the past winter season provided a poor basis for analysis and generalization. Since the measurable effects of YRDST were small, there is no unambiguous direct evidence that they were either beneficial or harmful.

Using the best information available, indicators were developed that produced the following results:

1. YRDST probably resulted in a flattening of the daily peakloads and a decrease on the order of 0.75 percent in electricity consumption for January and February. Savings of approximately 1 percent for March and April in fuel consumption for electricity production are inferred from the experience of transitions to daylight saving time in previous years. The predominant fuel saved is coal.

2. Total travel and gasoline use in the U.S. was generally reduced for winter months of 1973/1974 compared to the winter months of 1972/1973. However, YRDST may have resulted in a very small increase in travel and gasoline use in January and February in a few southern states where the weather was warm and where gasoline supply was not highly constrained last winter. In those states in which gasoline supply was constrained last winter, YRDST did not increase gasoline use, but may have modified travel patterns. In March and April, when gasoline supplies were more available and much larger areas of the country were warm, YRDST may have increased gasoline use as much as 0.5 to approximately 1.0 percent over the amount forecast under conditions of standard time.

3. Analyses of heating fuel effects of YRDST were inconclusive.

4. No significant effects on traffic safety can be attributed to YRDST. Data for January-March 1974, show a decrease of 23.8 percent in motor vehicle fatalities, as compared to the corresponding months of 1973, but this

decline is largely attributable to the lowering of speed limits and restrictions on the availability of gasoline. Motor vehicle accident data (non-fatality data) for the period of YRDST in 1974 were not available for analysis. Theoretical analyses of previous year accident data were inconclusive.

5. Fatalities involving school age children over the entire day in both January and February 1974 are reduced from the previous year. There was an increase in school children fatalities during the morning hours of 6 to 9 a.m. for February 1974 v. February 1973, but an offsetting decrease in fatalities occurred in the early evening hours. The unusual winter travel conditions as a consequence of the energy crisis make interpretation of net YRDST effects difficult.

6. Reports from 37 States and the District of Columbia indicate school districts in 18 States advanced their school hours because of the problems of dark mornings. About 44 percent of the school districts and 47 percent of the students enrolled in the 37 reporting States were affected by the schedule changes.

7. The Federal Communications Commission has reported that YRDST is causing adverse economic impacts for some daytime only and fulltime radio stations because of interference problems between these two classes of stations during their prime time morning rush-hour broadcasts.

8. The Department of Commerce reports no significant YRDST effects on domestic and international commerce, except for the construction industry. This industry opposes YRDST because of the safety hazards of working during the early morning darkness.

9. No measurable effects of YRDST were reported by cognizant Federal agencies in the areas of crime, agriculture, labor, and the use of parks and recreation facilities.

10. Daylight saving time is generally popular with the public, but not in the winter months of November through February.

RECOMMENDATIONS

The Department of Transportation recommends that the Emergency Daylight Saving Time Energy Conservation Act of 1973 be amended to provide that, for the balance of the experiment, the nation observe daylight saving time for eight months of the year and standard time from the last Sunday in October 1974 through the last Sunday in February 1975. Additionally, it is recommended that the date required for the final YRDST report be changed to September 30, 1975, to allow ample time to collect and analyze March and April data.

The principal reasons for this recommended course of action are:

- o Probable savings in energy. Electricity savings of approximately one percent occurred during March and April, with coal the predominant fuel saved. Further evaluations of other areas of fuel use such as transportation or heating are not definitive and may disclose additional savings or partially offsetting increases.
- o Elimination of concern regarding school children safety. While there was public apprehension over the safety of children traveling to school on dark mornings, the limited data available for the brief period of last winter's YRDST experience and the unusual travel conditions prevailing at that time do not provide an adequate basis to determine whether the public's apprehension was justified. Sunrises during March and April occur early enough so that this concern about early morning darkness may be eliminated.

- Public preference. A majority of the public, as measured in a March 1974 national opinion poll, prefers daylight saving time from March through October.
- Need for more conclusive data. It is desirable to have another year's experiment to determine better the net effects of daylight saving time and consequent public reactions so as to establish the merits of altering the historical daylight saving time system.

1. BACKGROUND

1.1 THE YEAR-ROUND DAYLIGHT SAVING TIME ACT (YRDST) AND THE ENERGY EMERGENCY

In the autumn of 1973 the United States, along with many other nations of the world, encountered its first prolonged, peacetime energy shortage. The causes and proportions of this shortage could not be immediately ascertained because of the complexity of the world's energy production and distribution systems. In a short period of time, however, experts and non-experts alike perceived that impacts of a significant energy shortage would pervade nearly all aspects of life in a technological society. Primary impacts, reduction of our heating, lighting, and transportation capabilities, would lead to further impacts in the economic and social life of the country. As with any problem of which the causes are not clearly understood, there were no apparent, adequate solutions. Emerging technologies offered promise of eventual amelioration, but could do nothing to raise the current supply of energy to the level of the current demand.

In this situation, the demand for energy had to be lowered to the level of available supplies. If measures were not taken by the government to reduce this demand in such a way that disruptions and hardships were minimized, this demand reduction would ultimately be done by the market system with no control over adverse effects. A whole menu of energy conserving measures was suggested by both public officials and private citizens. The diversity and number of these suggestions indicated the extent to which the American life style had become energy-oriented and reflected an almost cavalier attitude toward energy resources inherent in that life style. Given this situation, Congress faced the task of establishing Federal policies that would encourage the reduction of energy consumption with minimal negative social and economic effects.

Twice before, in the energy-scarce periods during the World Wars, daylight saving time (DST) had proven effective in dissipating

evening peaks in the demand for electrical power. These historical experiences naturally led to the hypothesis that advancing time nationally on a year-round basis would alleviate some of the pressure of the current energy shortage. With this in mind, last December, Congress enacted the Emergency Daylight Saving Time Energy Conservation Act of 1973 to place the nation on YRDST for a two-year trial period. In addition to the expected energy saving in electrical power consumption, other energy economies were anticipated. One of the hoped-for effects of year-round daylight time was that it would actively involve the American people in an energy conservation effort and that this involvement would lead individuals to a sensitivity to energy usage in their own lives. The magnitude of the resultant energy savings, however, was impossible to predict at the time of the passage of the Act. Also, a number of ancillary benefits were anticipated, including reduced crime, improved traffic safety, greater overlap with the European business day, and more afternoon and evening daylight for increased shopping and recreation opportunities. These benefits were also impossible to quantify when the Act was passed. To gain a broader understanding of the effects of year-round daylight saving time, Congress included in the Act a requirement that the Secretary of Transportation prepare interim and final reports on the operation and effects of the Act. After less than half a year of operation, preliminary analysis has been completed, and this document is the required interim report.

1.2 HISTORY OF DAYLIGHT SAVING TIME

The standardization of time in the United States is a relatively recent phenomenon. It wasn't until 1883 that the nation was divided into four time zones. The unofficial zones were created by American and Canadian railroads to reduce the confusion of operating out of terminals run on local sun times. Eventually, local communities adopted railroad time, so some degree of national standardization was effected without action by the Federal government.

During World War I, daylight saving time was proposed to reduce energy consumption. The Standard Time Act of 1918, approved March 19, 1918, both empowered the Interstate Commerce Commission to establish official time zones in the United States and provided for approximately seven months of daylight saving time each year - from the last Sunday in March to the last Sunday in October. Popular reaction to daylight saving time was generally negative and the daylight saving provision of the Act was repealed in 1919, after only two summers of advanced time.

From 1919 until 1942 various municipalities and states enacted DST within their jurisdictions, especially in the East and Middle West. Daylight time was not observed again nationally, however, until World War II when the national defense justified the measure as a means of reducing energy consumption. "War Time" advanced the clock one hour throughout the year and remained in effect until September 1945, shortly after the end of the War.

From 1945 to 1966, the question of daylight time was again left to localities and states. In this period, many of the far western states joined areas in the East and Middle West in the observance of advanced time for varying periods of time each year. This variance, and the biannual resetting of the clock, proved both annoying and confusing to many people. Other problems developed becasue the 1918 Standard Time Act contained no provisions for general observance or enforcement except in a limited number of specific areas. This meant that a single community might be on the Federal time standard for interstate and foreign commerce and other activities governed by Federal law, and on a local standard for everything else.

Beginning in 1948, bills were introduced in Congress for nationwide daylight saving time, but it wasn't until the Uniform Time Act of 1966 that Congress enacted both six months of nationwide daylight time and provisions for the I.C.C.'s enforcement of Federal time standards. With the establishment of the Department of Transportation, on April 1, 1967, all of the I.C.C.'s functions established in the 1918 and 1966 Time Acts were transferred to the

Secretary of Transportation. Thus, the operation of the first nationwide daylight time since World War II became a mission of the Department of Transportation, whose responsibility it has been ever since.

2. DESCRIPTION AND OPERATION OF YEAR-ROUND DAYLIGHT SAVING TIME

2.1 ADMINISTRATION

Primary responsibility for administration of the Act reproduced in Appendix H, Vol. I has been entrusted to the Secretary of Transportation. Section 3 of the Act establishes year-round daylight saving time, authorizes exemptions and realignments of time zone limits, and, in subsection (d), makes applicable to its provisions subsections (b) and (c) of section 3 of the Uniform Time Act of 1966 (April 13, 1966, Public Law 89-387, sections 3 (b) and (c), 15 U.S.C. 260a (b) and (c), reproduced in Appendix B, Vol. II). Those subsections read as follows:

> (b) It is hereby declared that it is the express intent of Congress by this section to supersede any and all laws of the States or political subdivisions thereof insofar as they may now or hereafter provide for advances in time or change-over dates different from those specified in this section.
>
> (c) For any violation of the provisions of this section the Secretary of Transportation or his duly authorized agent may apply to the district court of the United States for the district in which such violation occurs for the enforcement of this section; and such court shall have jurisdiction to enforce obedience thereto by other process, mandatory or otherwise, restraining against further violations of this section and enjoining obedience thereto.

The effect of those subsections is to authorize the Secretary of Transportation to seek court enforcement of section 3 of the 1973 Act.

Section 3(a) of the 1973 Act establishes a one hour advancement to year-round daylight saving time "notwithstanding the provisions of section 3(a) of the Uniform Time Act of 1966." Section 3(a) of the Uniform Time Act establishes a one hour advancement to daylight saving time from the last Sunday in April until the last Sunday in October of each year. It also permits two types of

State exemption. (It should be noted here that section 3(d) of the 1973 Act also makes applicable to its provisions the definition of "State" which appears in section 7 of the Uniform Time Act. For the purposes of the 1973 Act, therefore, State includes the District of Columbia, the Commonwealth of Puerto Rico, and any possessions of the United States. The only possessions of the United States encompassed within the time zones established by Congress are the Virgin Islands, in the Atlantic standard time zone, and American Samoa, in the Bering standard time zone.) The first type of exemption is for an entire State; pursuant to this Arizona, Hawaii, Puerto Rico, the Virgin Islands, and American Samoa are exempt from the normal six months of daylight saving time. The second type, applicable only to those States with parts thereof in more than one time zone, if for all that part of a State which is in one time zone. There are thirteen States with parts thereof in more than one time zone - Alaska, Florida, Idaho, Indiana, Kansas, Kentucky, Michigan, Nebraska, North Dakota, Oregon, South Dakota, Tennessee, and Texas. All of these States are in two time zones save Alaska, which is in four. The only State which has exercised this form of exemption is Indiana, which has exempted its eastern time zone portion from the normal six months of daylight saving time.

The Department of Transportation has interpreted the "notwithstanding" phrase in section 3(a) of the 1973 Act to mean that section 3(a) of the Uniform Time Act is superseded - that is, that daylight saving time may not be observed from the last Sunday in April to the last Sunday in October and that a State may not implement the forms of exemption permitted in the Uniform Time Act. The only options, therefore, are those set forth in the 1973 Act - a State exempt from year-round daylight saving time under the 1973 Act may not observe six months of daylight saving time under the Uniform Time Act and must observe the standard time otherwise applicable to the time zone in which the State is located.

Section 3(a) of the 1973 Act permits two types of exemptions from year-round daylight saving time. It permits the thirteen States with parts thereof in more than one time zone to exempt all

that part which is in one time zone. As explained in the Joint Explanatory Statement of the Committee of Conference on H.R. 11324, it is intended by this authority and the similar authority in section 3(a)(2) of the Uniform Time Act of 1966 to permit any State divided by a single time zone boundary to put the entire State on the same clock time. (See House Report 93-709 at page 5.) This means that in such a State an exemption can apply only to that part of the State which is in the more easterly of the two time zones.

Section 3(a) of the 1973 Act also permits a State that lies entirely in one time zone and is not contiguous to any other State to exempt the entire State. The only States that meet both conditions are Hawaii, Puerto Rico, the Virgin Islands, and American Samoa. The Department has construed the intent of Congress to be that an eligible State may exercise its exemption authority at any time during the effectiveness of the 1973 Act and that the exemption also may take effect at any time during this period.

Section 3(c) of the 1973 Act relieves certain eligible States wishing to exempt from the necessity of formally exempting. Any law in effect on October 27, 1973, adopted pursuant to section 3(a)(2) of the Uniform Time Act by a State with parts thereof in more than one time zone, or adopted pursuant to section 3(a)(1) by a State that lies entirely in one time zone and is not contiguous to any other State, is held to be the exercise by the State of the exemption permitted in section 3(a) of the 1973 Act unless the State by law provides that such exemption shall not apply. The effect of section 3(c) is to make effective under the 1973 Act exemptions exercised under the Uniform Time Act by Indiana (as to its eastern zone part), Hawaii, Puerto Rico, the Virgin Islands, and American Samoa. (Arizona also enacted an exemption pursuant to section 3(a)(1) of the Uniform Time Act which was in effect on October 27, 1973; that exemption, however, does not remain in effect and Arizona may not otherwise exempt itself because, although it lies entirely within one time zone, it is contiguous to another State and therefore does not satisfy the statutory requirements for exemption.)

Under the Uniform Time Act exemptions from daylight saving time are matters of State law and realignments of time zone limits are by order of the Secretary of Transportation subject to the Administrative Procedure Act (5 U.S.C. 551 et. seq.) (Section 5 of the 1973 Act suspends during the effective period of the 1973 Act this authority of the Secretary under the Uniform Time Act to realign time zone limits.) Section 3(b) of the 1973 Act adds a new type of exemption, one by Federal authority, and significantly alters the manner in which time zone limits are realigned. It authorizes the President or his designee to grant to a State an exemption from year-round daylight saving time or realignment of time zone limits, notwithstanding any other provision of law, if the State, by proclamation of its Governor, makes a finding prior to the effective date of the 1973 Act (January 6, 1974) that such exemption or realignment is necessary to avoid undue hardship or to conserve energy in the State or part thereof. By Executive Order 11751 (December 15, 1973 Appendix C. Vol. II), the President designated and empowered the Secretary of Transportation to grant these exemptions and realignments.

To implement section 3(b) the Secretary of Transportation on December 19, 1973, issued regulations (Appendix D, Vol. II) which were published in the Federal Register of December 20, 1973, (38 FR 34876). On December 19, 1973, copies of the regulations were wired to the Governors of the States and the Commissioner of the District of Columbia. The regulations, appearing as a new Part 73 of Title 49 of the Code of Federal Regulations, set forth the criteria and procedures which the Secretary would utilize in considering the Governor's proclamations. Four proclamations were received, three seeking exemption and one seeking realignment of a time zone limit.

2.2 EXEMPTIONS

Realignment of the limit between the eastern and central time zones in Kentucky was sought by the Governor of Kentucky, the Honorable Wendell H. Ford. Normally, approximately half of the counties in Kentucky are in the eastern zone and half are in

the central zone. To relieve most of these eastern zone counties from undue hardships attendant upon year-round daylight saving time Governor Ford asked that the limit between the eastern and central time zones be realigned to include in the central zone all of Kentucky except twelve counties in the northeastern part of the State near the Ohio River in the Cincinnati, Ohio, and Huntington, West Virginia, metropolitan areas. The twelve counties were not encompassed within the Governor's request so that commerce within these two metropolitan areas would not be disrupted by a time difference. The Secretary granted the realignment requested by the Governor; since January 6, 1974, all of Kentucky except for the twelve counties has been in the central time zone observing year-round central daylight saving time; the twelve counties have been in the eastern zone observing year-round eastern daylight saving time. The limit between the eastern and central zones will revert to its normal alignment when the 1973 Act expires.

Requests for exemption were received which presented certain problems under the Act. The Honorable Jack Williams, Governor of Arizona, sought exemption for the entire State of Arizona, all of which is in the mountain time zone. Since Arizona does not have parts thereof in more than one time zone but is contiguous to another State it could be exempt only by grant of the Secretary pursuant to proclamation of the Governor. Governor Williams presented evidence that the high mean temperatures in Arizona coupled with daylight saving time would lead to increased use of electricity because of the need to use air conditioners one hour longer in late afternoon and evening than if the State were on standard time; daylight saving time would, therefore, not conserve fuel in the State but would, in fact, waste it. In view of this the Secretary granted the exemption. Arizona has been on mountain standard time since January 6, 1974, and will continue to be until the Act expires.

In contrast to Arizona, which could be exempt only by authority of the Secretary, Idaho is a State with parts thereof in more than one time zone - mountain and Pacific - and can, under the Act, exempt the mountain zone portion by State law. The

Governor of Idaho, the Honorable Cecil D. Andrus, however, requested such exemption from the Secretary. Governor Andrus presented evidence that year-round daylight saving time would impose undue hardship on the population in the mountain zone portion, a large part of whose economy is dependent upon business which must be conducted in daylight (e.g., lumbering and logging) and that more fuel would be used because of prolonged cold and darkness in the mornings.

Because of the close relations which exist between the mountain zone portion of Idaho and that small part of Oregon which also is in the mountain zone, the Honorable Tom McCall, Governor of Oregon, requested that whatever action the Secretary take with respect to Idaho he also take with respect to Oregon; in other words, exempt both or neither but maintain the same time in both regions.

It was felt that the Governor of Idaho presented justification for an exemption; it was also believed, however, that it is the intent of Congress that a State such as Idaho or Oregon, which has portions situated in more than one time zone, should invoke the exemption provision set forth in section 3(a) of the Act, if it desires to be exempt, and exempt by State law that portion of the State lying in the more easterly time zone. In recognition of the facts that the State Legislature of Idaho was not scheduled to convene until January 14, 1974, and that of Oregon until February 11, 1974, the Secretary found it necessary to the convenience of commerce and to avoid confusion within the two States to grant temporary exemptions under section 3(b) to permit sufficient time for consideration and action by the respective State Legislatures under section 3(a). Idaho was granted an exemption until Sunday, February 3, 1974; Oregon, until Sunday, February 24, 1974.

In case Idaho did not exempt by the expiration of the Secretary's exemption and its mountain zone portion began observing daylight saving time on February 3, 1974, it was provided in the grant to Oregon that an expiration date earlier than February 24, 1974, would be granted if Governor McCall so requested. Idaho

did not exempt by February 3, 1974, and, at Governor McCall's request, the expiration of the Oregon exemption was later changed to February 3, 1974.

As of May 1, 1974, two States have adopted laws exempting from year-round daylight saving time under section 3(a) of the Act. Both exemptions become effective at 2:00 a.m. on the last Sunday of October 1974 (October 27, 1974). The two States are Michigan (as to its eastern zone portion) and Idaho (as to its mountain zone portion). The Idaho exemption may prompt an exemption for Oregon for its mountain zone portion. That decision has not been made yet.

2.3 DIFFERENCES BETWEEN 1966 ACT AND 1973 ACT

The 1973 Act establishes a one hour advancement to daylight saving time for twelve months each year rather than the 1966 Act's six months each year (last Sunday in April to last Sunday in October).

The 1973 Act permits exemption from daylight saving by only two types of States - States with parts thereof in more than one time zone and States that are entirely within one time zone and not contiguous to another State; the 1966 Act permits exemption by any State.

The 1973 Act permits a State with parts thereof in more than one time zone to exempt from daylight saving time only that part of the State which is in the more easterly time zone; the 1966 Act Permits a State with parts thereof in more than one time zone to exempt either that part of the State which is in the more easterly time zone or the entire State.

The 1973 Act authorizes a realignment of time zone limits only if a State, by proclamation of its Governor, makes a finding prior to the effective date of the Act (January 6, 1974) that such realignment is necessary to avoid undue hardship or to conserve energy in such State or part thereof; the 1966 Act authorizes realignment of time zone limits, subject to the Administrative Procedure Act, "having regard for the convenience of commerce and the existing junction points and division points of common carriers

engaged in interstate or foreign commerce." The 1973 Act also suspends during its effective period the Secretary of Transportation's authority under the 1966 Act to realign time zone limits.

2.4 RADIO BROADCASTING

Section 6 of PL 93-182 requires that the Federal Communications Commission (FCC) make adjustments "to hours of operation of daytime standard amplitude modulation broadcast stations, as may be consistent with the public interest, including the public's interest in receiving interference free service."

These adjustments were thought to be needed because of increased conflicts among various classes of radio stations arising from the adoption of YRDST. To gain perspective on the reasons for such conflicts, we will briefly describe the technical basis for radio channel management and how YRDST results in difficulties for some of the radio stations.

Radio waves broadcast at night travel much farther than those broadcast between sunrise and sunset. Consequently, more stations can broadcast from different locations on a single channel during the day without interference, than can at night. In recognition of this fact, the FCC licenses some stations as fulltime stations, others as daytime only. The fulltime stations are intended for long-distance night time communications to serve remote regions that do not have night time major service.

When a switch to YRDST brings sunrise an hour later, those stations licensed to broadcast only after sunrise lose an hour's broadcast time in the morning. In late fall, winter, and early spring, this lost hour falls during job commuting time, which can account for as much as 20% of a station's advertising revenues.

The several hundred daytime stations most strongly affected divide into two groups. For one group, the channel on which they operate is shared with domestic fulltime stations having channel priority. For the other group, the channel is shared with foreign stations in Canada, Mexico, and the Bahamas. The relief afforded daytime stations by the FCC has varied for the two groups.

Channels involving foreign stations are covered by international agreement and changes in broadcasting times can be made only with the consent of the foreign government concerned. Negotiations are currently underway. Those with Canada are nearing completion and offer hope that some relief to U.S. daytime stations will result.

In general, daytimers not affected by international agreement have been allowed to sign on one hour earlier during the October-April portion of the year, though only at the relatively low power of 50 watts. This is temporary, pending the outcome of hearings and further rule making. In spite of the adjustment to earlier sign-on times, daytimers are continuing to experience audience losses to some extent. During this hour the daytimers' operations are confined to a service area of approximately a two-mile radius. Beyond this point potential morning audiences are lost due to interference from fulltime stations.

It is not only daytime stations that have experienced some loss. Some fulltime stations are experiencing serious audience losses during the prime time hour from 8 to 9 a.m. These losses result from the one-hour clock time delay in switching from authorized one kilowatt directional night time facilities to five kilowatt non-directional daytime facilities, as well as from the interference generated by daytimers who have been permitted to sign on one hour earlier. This latter problem impacts most severely on audiences in certain rural areas of the country. Once their fulltime station is interfered with, these audiences are being denied service of any kind during this early morning hour.

Clearly, the basic facts of radio wave propagation conditions and interference in the AM broadcast band create an irreconciliable conflict of interests when YRDST is in effect. The twin objectives in section 6 of the Act of (a) maximizing the pre-sunrise services of daytime stations and (b) guaranteeing the continued interference-free reception of fulltime services, therefore, tend to be mutually exclusive. The FCC believes that

whatever long-term solutions emerge from the rule-making proceedings cannot satisfy all segments of the AM broadcast industry.

3. METHODOLOGY

3.1 OVERVIEW

Quite simply, what daylight saving time "does" is shift institutionalized human behavior patterns relative to the natural light of day. Since it is not entirely clear what the effects of light are on human activity, it is also unclear which areas of human activity might be affected by such a shift. In determining plausible areas of impact for analysis prior to conducting this study, DOT utilized three major sources: the Act, Congressional hearings held on a number of DST bills, and a British YRDST report, Review of British Standard Time, prepared by the Home Office and the Scottish Home and Health Department. Effects attributed to YRDST in these documents can be broken into a half dozen impact areas: energy, travel, traffic safety, crime, commerce and recreation. DOT anticipated, at the beginning of the study, that few concrete conclusions would be drawn from any of the technical results, because of the difficulty of isolating the small effects of the time change from the much larger effects of the energy shortage. Nevertheless, it was recognized that decisions are going to be made with respect to YRDST, and there are real issues that bear on these decisions. Therefore, the study methodology addressed the impact areas outlined above in a search for indicators of effects in these areas. The quality of existing data precluded any sort of rigorous quantitative analysis that would lead to conclusions that could be stated with a high level of confidence. It was felt that in each hypothesized impact area there were selected indicators of effects that, despite their limitations, would aid in evaluation of YRDST. Table 3-1 lists plausible mechanisms of effects in each impact area and selected indicators of the occurrence of these effects.

The methodology for this study will entail the following process:

TABLE 3-1 PLAUSIBLE YRDST IMPACT MECHANISMS

	Hypothesized Change In Levels	Anecdotal Description of Mechanism of Plausible Change	Selected Indicators
1. Energy			
A. Electricity (lighting)	Reduced Use	Reduced lighting needs in evening, but increase somewhat in morning; effect more urban than rural; effect is residential, not industrial	• Aggregate use week before and week after • Shifts between morning and evening • Daily use pattern comparisons employing "influenced period" processing technique
B. Gasoline (travel)	Increased Use	Increased recreational and shopping travel after work, very little effect in morning	• Gasoline sales for selected companies week before and after • Distribution of recreational and shopping travel before and after dark • Recreational activity in early evening • Accident rates for "equivalent days" displaced by shifting sunrise by one hour
C. Fuel, Oil, Natural Gas Electricity (heating)	Reduced Use	People in warm climates (southern part of country) use heat only in the evening	• NORC survey describing heating control behavior plus theoretical model translating behavior into fuel effects.

TABLE 3-1 PLAUSIBLE YRDST IMPACT MECHANISMS - CONTINUED

	Hypothesized Change In Levels	Anecdotal Description of Mechanism of Plausible Change	Selected Indicators
2. Travel	• Increased congestion in morning; some decrease in early evening	• For morning, darkness would impair traffic flow; • For evening, there are two partially offsetting factors: (a) improved traffic flow due to extra light (b) extra traffic volume due to extra shopping and recreational travel	• Traffic flow impacts of light and darkness • Analysis of travel (gasoline analysis)
3. Traffic Safety			
A. General Fatalities and Accidents	Net Increase	Net effect of the following factors: (1) increase in accidents in morning due to extra darkness (2) decrease in afternoon peak hour accidents due to lighter conconditions (3) increase in early evening accidents due to extra travel	• Morning and afternoon rush hour fatality and accident rates • Day vs. night fatality rates • Accident rates on equivalent days with sunrise and sunset offset by one hour using "influenced period" technique

TABLE 3-1 PLAUSIBLE YRDST IMPACT MECHANISMS - CONTINUED

	Hypothesized Change In Levels	Anecdotal Description of Mechanism of Plausible Change	Selected Indicators
3. Traffic Safety (continued)			
B. School Children Fatalities and Accidents	Small Increased Risk	Safety impaired before school due to darkness in morning uncompensated for by safety improvements after school	• Aggregate school children fatality comparison to previous years • Amount of shifting of starting time of schools
4. Crime			
A. General Criminal Activity	Reduced Level	Crime rates in dark of evening much greater than rates in morning	• Larger increases in early morning crime than early evening crime in selected regions
B. Criminal Offenses against Children	Increased Level	Increased exposure in morning	• Increases in rates of crimes against children in excess of increases in other crimes and in excess of previous trends
5. Commerce			
A. Shopping Activity	Increased Level	Increased light after work results in more shopping	• Comparisons for week before and after DST transition for sales at eating places and of general merchandize.
B. Foreign Trade			• Opinions of the Departments of State and Commerce

TABLE 3-1 PLAUSIBLE YRDST IMPACT MECHANISMS - CONTINUED

	Hypothesized Change In Levels	Anecdotal Description of Mechanism of Plausible Change	Selected Indicators
6. Recreation	Increased Level	Increased light after work and school offers more time suitable for recreation. Very little effect in morning	• Comparison of sales in eating establishments before and after transitions • Analysis of use of National parks in and near urban centers • NORC surveys

1. Review the anecdotal descriptions of effects of YRDST as presented in Congressional hearings and in other studies (mainly the British Study).
2. Find indicators to "test" the validity of the anecdotal descriptions (i.e., are they consistent or not).
3. Get opinions and analytical inputs from other governmental agencies having expertise relating to the impact areas described in the anecdotal descriptions.
4. Analyze public opinion and behavior vis-a-vis DST.
5. Eliminate "behavioral hypotheses" that are not supported by a related set of indicators.
6. Develop "behavioral hypotheses" which best "explain" the pattern of indicators and data observed.

"Behavioral hypotheses" will be developed and analyzed later in this report for: (1) electricity use as a function of residential lighting loads by time of year; and (2) gasoline use by time of year as functions of weather and lighting conditions. These behavioral hypotheses will then be shown to be consistent with a broad pattern of indicators. None of these indicators by

itself is solid evidence that the behavioral hypotheses are correct. Yet the pattern of indicators, as will be shown, does comprise a surprisingly consistent set which, taken as a pattern, may largely and plausibly "be explained" by the behavorial hypotheses.

In the area of heating (impacting on the demands for fuel oil and natural gas for the most part), a behavioral model is developed which identifies the alternative ways by which the heating load could be influenced depending mainly on the daily operation of heating systems and the local pattern of temperature conditions. Sufficient behavioral data were not available to conduct a meaningful assessment of the effects of YRDST on heating loads.

In later discussions, the effects on recreation, safety, and shopping activity will be correlated with the major "behavioral hypotheses" governing travel.

3.2 LIMITATIONS OF THE METHODOLOGY

Initially, it was hoped that impacts could be measured by comparing differences between data from before and after the January 6, 1974 implementation date and separating out time effects. This transition date occurred simultaneously with a number of other changes precipitated by the energy crisis, and the small effects of the transition got lost in this rapidly changing context. Fine detail, high accuracy data needed to develop valid cause and effect models are not presently available. For this reason techniques had to be developed which would indirectly yield the desired information.

A number of techniques were used to isolate the effects of daylight saving time:

1. Analysis of before and after the January 6, 1974 transition. This was done in electricity use for 22 power companies and for travel. The electricity analysis used adjustment factors to separate out temperature effects.

2. Analysis of before and after the fourteen DST transitions from 1967 to 1973 in the fall and the spring. This was done for the electricity, travel and gasoline use studies.

3. Analysis of summer gasoline consumption before and after the transition to national uniform daylight saving time in 1967.

4. Analysis using a theoretical technique called the "equivalent day" method*. This was used to analyze accidents, electricity use, and travel.

Limitations of the analyses involving short periods of time before and after a particular transition (techniques 1 and 2 above) are that any effects measured for just after the transition may be due to the abrupt change in time system and may not be persistent. Furthermore, the utility of these transition techniques depends upon the reliability of techniques for extrapolating the results of the transition analysis to other parts of the year. In fact, such extrapolating methodologies were postulated and called "behavioral hypotheses". These behavioral hypotheses "explained" the pattern of the observed indicators and "in broad brush" their seasonal and regional variations. Behavioral hypotheses were developed for annual residential lighting load and for travel patterns.

Limitations of the second and third techniques (before and after the transition to uniform daylight saving time for 1967 and 1967-73) are that effects of daylight saving time are small compared to other influencing factors for the parameters being measured (national economic activity, for example, is thought to be a more important determinant of gasoline use than daylight saving time). Without high quality models and data, these techniques did not yield reliable indicators bearing on daylight saving time effects on gasoline.

*The equivalent day method is described in detail in Volume II. Briefly, it is a heuristic analytical technique whose objective is to separate out lighting from non-lighting effects.

The final technique, the equivalent day approach, also has limitations. The equivalent day analyses data from a number of "equivalent days" throughout the winter period. Pairs of days with sunrise or sunset one hour apart were compared to establish the effects of the "extra" hour of daylight. Assuming that some periods of the day are uninfluenced by light changes attributable to a one hour shift in the clock time, these "uninfluenced periods" were used to normalize "influenced period" results and eliminate the effects of extraneous factors like weather and other seasonal variations. This technique and a critique of it are described more fully in Volume II. However, limitations in the technique arise in the notion of the validity of equivalence (How much alike are they?) and the notion of uninfluenced period (How does one really know that it is influenced?).

3.2.1 Lack of Valid "Cause and Effect" Models

A caveat is in order regarding the results obtained with the use of such surrogate techniques: no verifiable causal connection can be claimed to exist between the cause (YRDST) and the effect (societal impact) attributed to it. It is probable that causal connections between a change in clock time vs. sun time and a number of societal variables exist. Their existence, however, cannot be "proven" because of the quality of relevant data. A rigorous mathematical proof of cause and effect requires data on both present and past situations, and investigations of other causes which might be responsible for the observed impact. Causal connection is measured by tests of statistical significance which cannot be made because of the lack of accurate, fine detail data. Given this data situation, the surrogate techniques described above and in the Supporting Studies section are the best available indicators of effects of YRDST. They cannot provide, and do not pretend to provide, unquestionable confirmation of the existence and magnitude of the postulated causal connections.

3.2.2 Uncertainty About Long-Term Effects

Another limitation of the methodology is that it gives indications of short-term effects but not of the more relevant long-term effects. In measuring changes in variables like energy consumption, travel patterns, etc., what are actually being measured are changes in human behavior patterns. Human behavior is homeostatic in that it is equilibrium-seeking. Human responses assume dynamic, rather than static, patterns; consequently long-term effects of a change in the living environment may differ from short-term effects. The fluctuation of attitudes toward DST, documented in the Social Surveys (Section 5) of this report, illustrates this phenomenon. The same dynamic must be assumed to be operative in the areas of like energy consumption, travel behavior, and the like. Since this interim report was, of necessity, based on data from transition periods, the findings apply to short-term, and not long-term, effects. The assumption that short- and long-term effects resemble each other is justifiable, but it must be recognized as an assumption.

4. DESCRIPTION OF SUNRISE AND SUNSET TIMES

4.1 CHANGES IN DAYLIGHT DURING THE YEAR

Over the course of the year, sunrise and sunset times in any given place vary by almost three hours. Thus the longest days of the year in summer have almost six hours more daylight than the shortest days in winter. This familiar phenomenon is illustrated in Figure 4-1 for Washington, DC. Sunrise and sunset times for other places in the U.S. would occur at different times, but the general shape of the curve would be similar. In the figure, the months are shown running from July to June, so that the winter months, which are the focus of this report, can be shown as a continuous period. The figure shows both Standard Time and Year-Round Daylight Saving Time. Daylight Saving Time is Standard Time plus one hour.

Figure 4-2 which is based on Figure 4-1 shows the system of Daylight Saving Time in effect nationally from 1967 - 1973, and customary in many places for a number of years before 1967. This system has Standard Time from November through April, the winter months of the year, and Daylight Saving Time from May through October, the summer months of the year. The figure also shows, for Washington, DC, four pivotal points in time around which the season turns: these points are the shortest day of the year, the latest sunrise, the earliest sunset, and the coldest day. Once these points are passed, the year seems to be progressing again towards spring. These four points occur at different times, and instead of occupying a single day, extend over several days.

For Washington, DC, the shortest days of the year (9 hours, 27 minutes) are December 17 to 27, a period of days extending on either side of December 21, which is commonly thought of as the shortest day of the year. The earliest sunsets (4:46 p.m. Standard time) occur from December 3 to 11. The latest sunrises (7:27 a.m. Standard Time) occur from December 31 to January 10. The minimum temperature normals (29^{o}), a measure of the coldest days of the year,

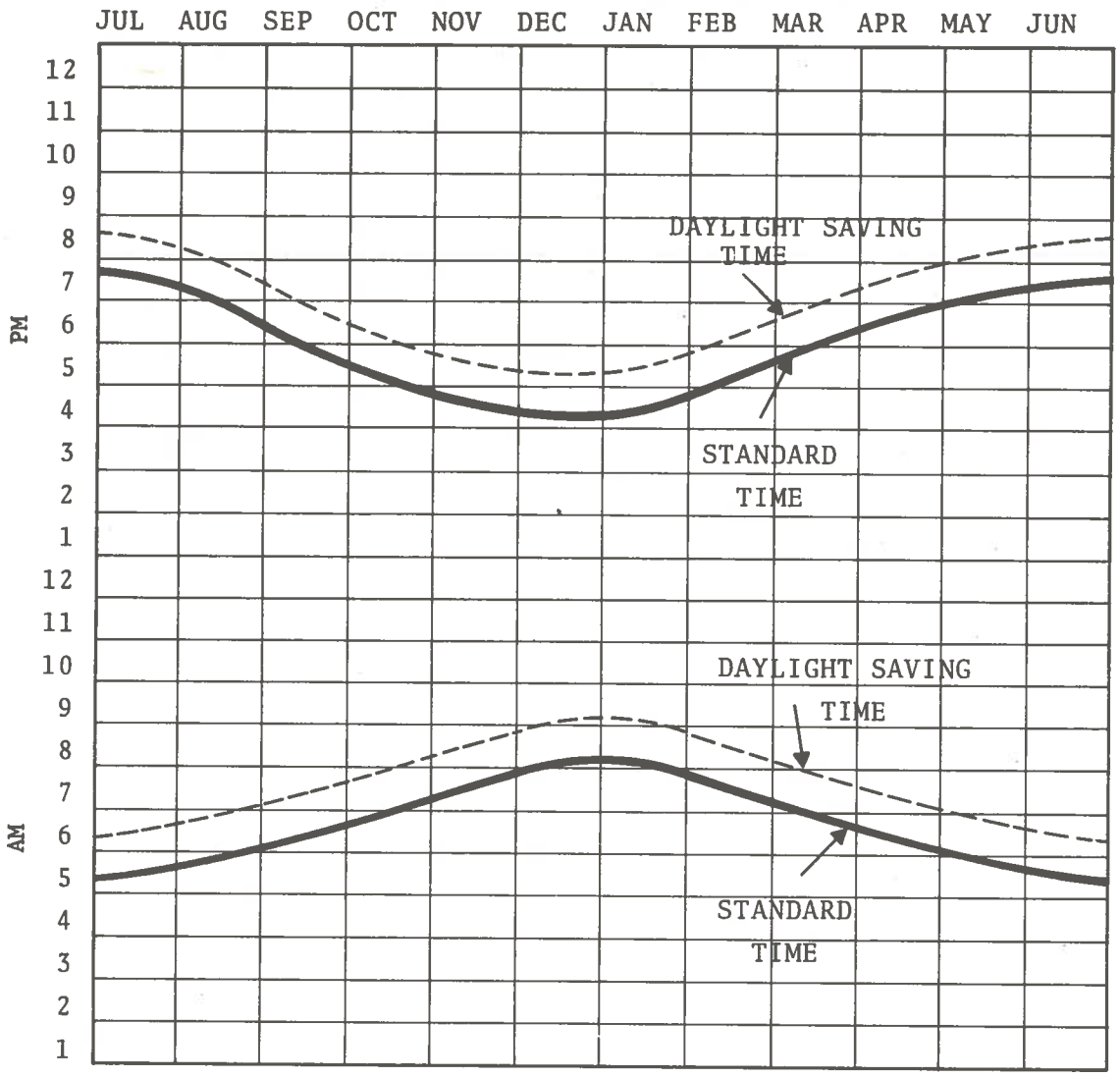

Figure 4-1 Sunrise and Sunset Times, Washington, DC
Standard and Daylight Saving Time

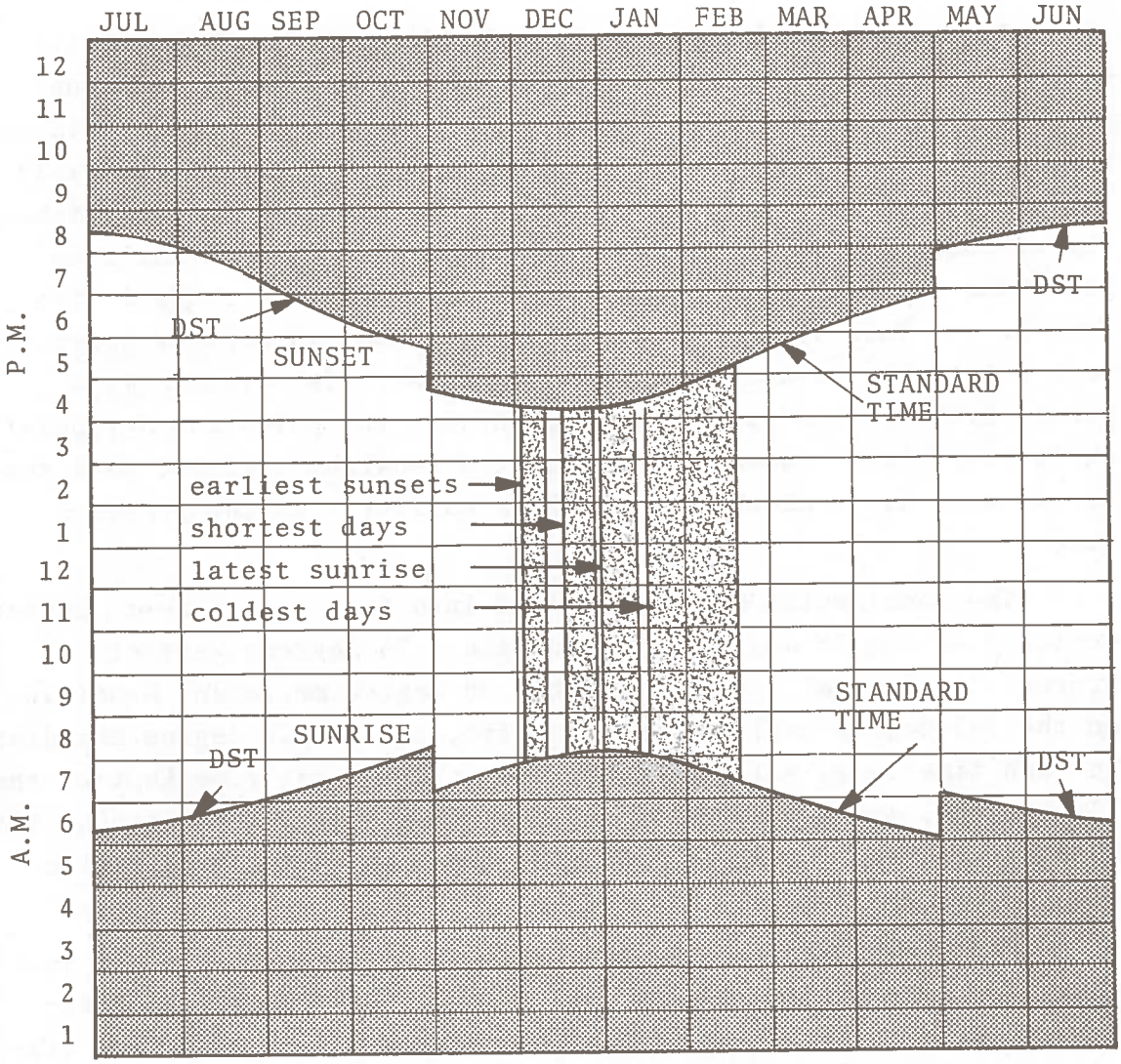

Figure 4-2 Sunrise and Sunset Times, Washington, DC and Earliest Sunsets, Shortest Days, Latest Sunrise and Coldest Days

occur from January 15 to February 19. The midpoint of the winter Standard Time period under the 1967-1973 system, which occurs around January 31, thus coincides with the period of coldest weather rather than with the shortest days, latest sunrise or earliest sunset.

4.2 STANDARD TIME

Before standard time was introduced, each locality set its clocks on local time, taking as noon the point at which the sun passed directly overhead. This system of local timekeeping did not pose any difficulties until railroads in the U.S. permitted rapid travel between different parts of the country, each on local time. The confusion caused by the proliferation of local and railroad times was resolved by the adoption of standard time zones in the 1880's. In this system, 24 standard meridians 15 degrees apart were set as the standards for 24 time zones. (A meridian is a great circle of the earth, passing through the poles and any point on the earth's surface.) Starting at Greenwich, England, each zone to the west has a clock time one hour earlier than the previous zone.

The continental U.S. is divided into four time zones: Eastern, centered on the 75 degree meridian (i.e., 75 degrees west of Greenwich); Central, centered on the 90 degree meridian; Mountain, on the 105 degree meridian; and Pacific, on the 120 degree meridian. In each time zone, all clocks are set at the local time kept at the 75, 90, 105, and 120 degree meridians respectively. Additional time zones govern time in Alaska, Hawaii, American Samoa, Puerto Rico and the Virgin Islands.

The boundaries between time zones were initially set at railroad conventions held in 1883, and formally adopted by the Interstate Commerce Commission under authorization of the Standard Time Act of 1918. Since 1918, the zone boundaries have changed frequently, the general trend being a westward movement of the boundaries. This redelineation of boundaries has enabled portions of a state towards the eastern part of a time zone to join the adjacent zone to its east. For example, Michigan, the western part of Ohio, Indiana,

Kentucky, Tennessee, and the eastern part of Georgia were originally part of the Central Time Zone. Through various modifications, these states or parts of states are now in the Eastern Time Zone. Similar redrawing of the boundaries have occurred in the boundaries between Central and Mountain, and Mountain and Pacific Time Zones.

The current time zones are shown in Figure 4-3.

4.3 DAYLIGHT DIFFERENCES WITHIN A TIME ZONE

Within any of the U.S. time zones, sunrise and sunset times at different places may differ by as much as an hour. These variations depend both on the position of the place in relation to the meridian on which the standard is based, and on the latitude of the place (latitude is the angular distance north or south of the equator). The following rules give some guidance to variations within a time zone:

1. The farther east in the time zone, the earlier the sunrise and sunset.
2. Conversely, the farther west in the time zone, the later the sunrise and sunset.
3. The farther south in the time zone, the longer the days are in the winter.
4. Conversely, the farther north in the time zone, the shorter the days are in the winter.
5. All points on a given meridian have midday at the same time.
6. At the equinox, all of the points on a given meridian have sunrise and sunset at about the same time. (The equinox, occurring on or about March 21 and September 22, is the time when the sun crosses the plane of the equator, making night and day all over the earth of equal length.)

Table 4-1 shows sunrise and sunset times for 24 cities, six in each time zone (see Figure 4-4). These cities were selected to show daylight conditions in various parts of the time zone.

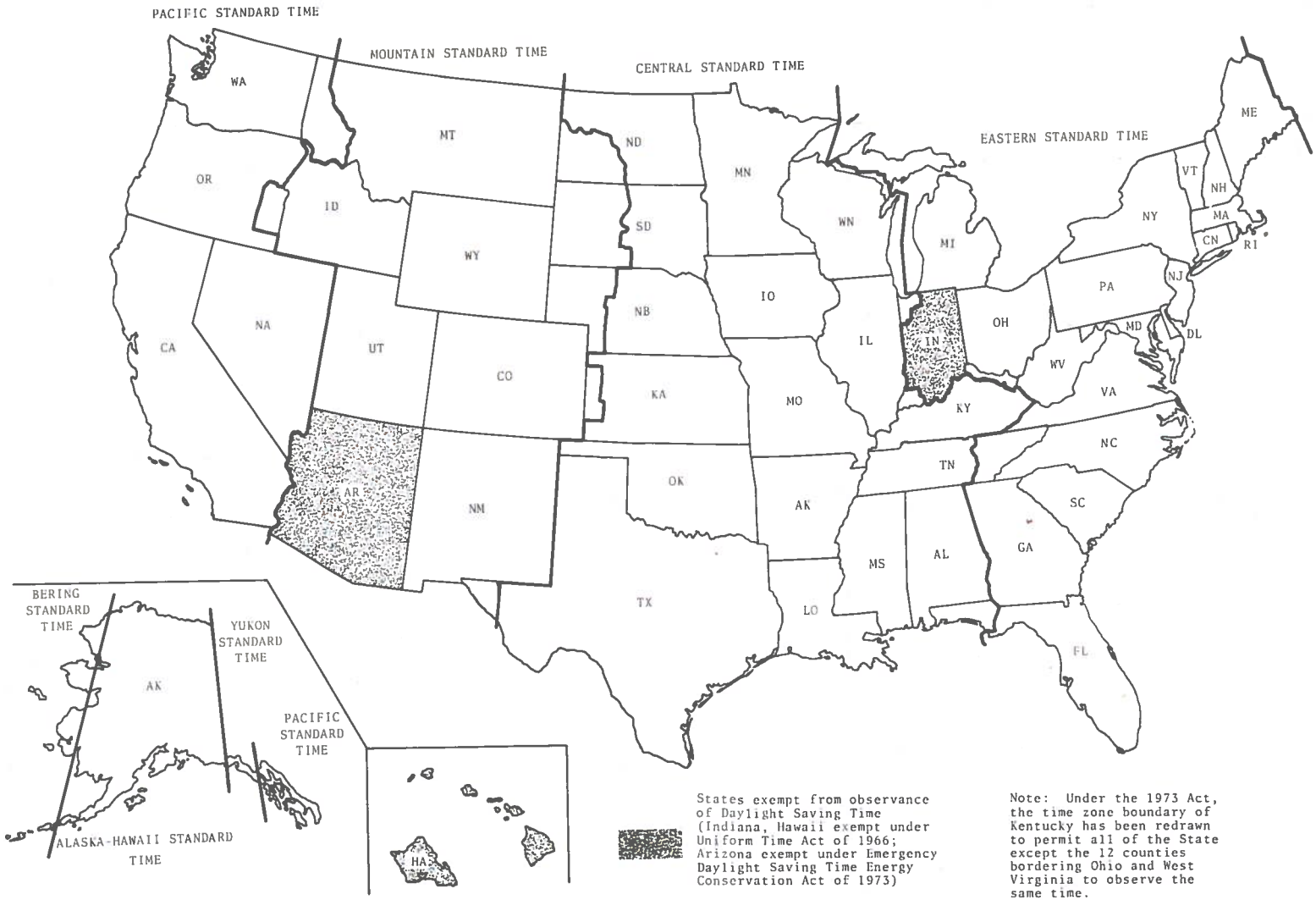

Figure 4-3 Time Zones of the United States

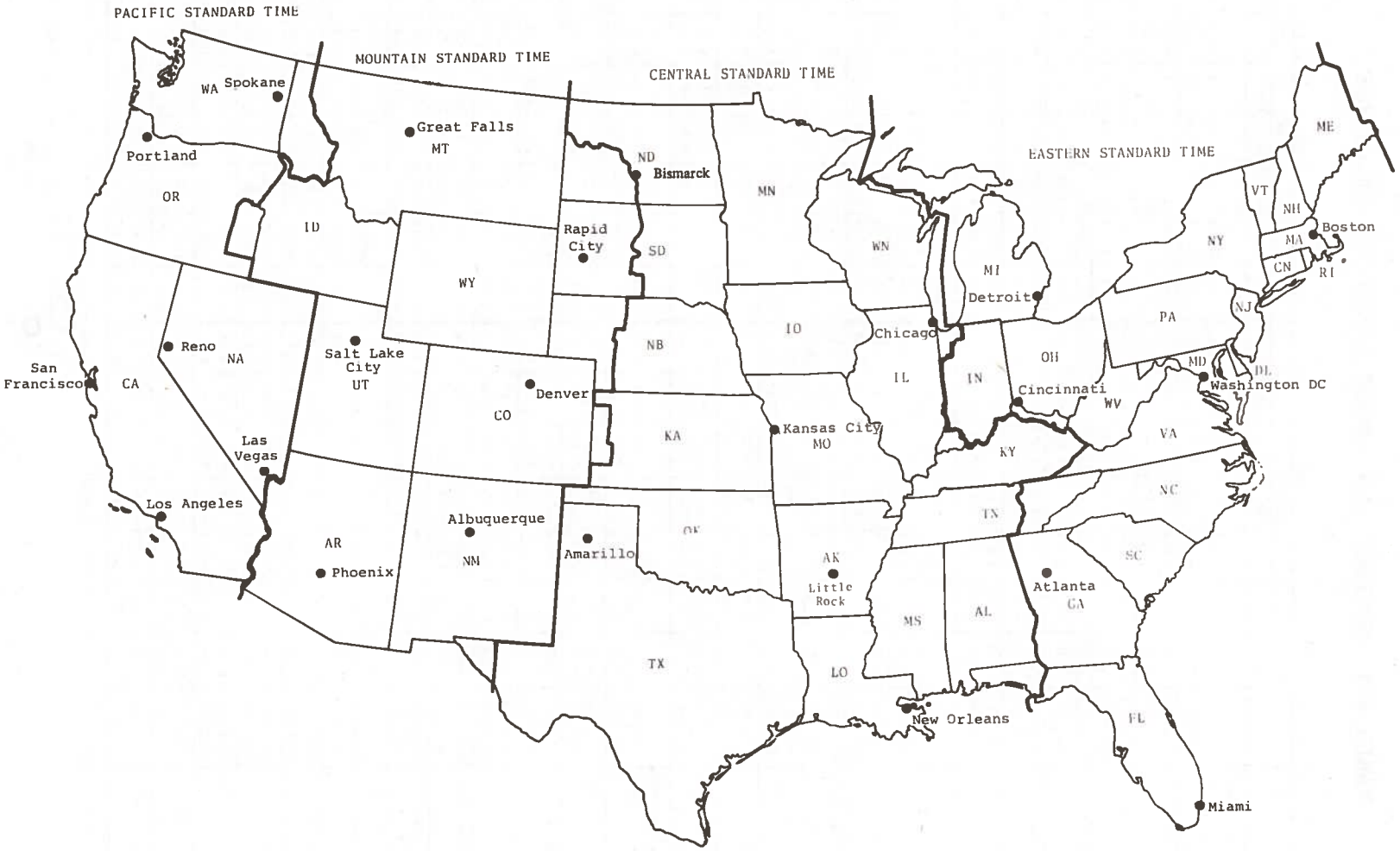

Figure 4-4 Map of 24 Cities for which Sunrise and Sunset Times are Provided

TABLE 4-1 SUNRISE AND SUNSET TIMES FOR 24 CITIES

		SUNRISE							SUNSET						
		Nov 1	Dec 1	Jan 1	Feb 1	Mar 1	Apr 1	May 1	Nov 1	Dec 1	Jan 1	Feb1	Mar 1	Apr 1	May 1
EASTERN TIME ZONE															
Boston, Ma.	Standard	6.17	6.54	7.14•	6.58	6.20	5.27	4.40	4.38	4.13*	4.22	4.58	5.34	6.10	6.44
	Daylight	7.17	7.54	8.14•	7.58	7.20	6.27	5.40	5.38	5.13*	5.22	5.58	6.34	7.10	7.44
Detroit, Mich.	Standard	7.06	7.42	8.02•	7.47	7.09	6.17	5.29	5.27	5.02*	5.12	5.48	6.23	6.59	7.32
	Daylight	8.06	8.42	9.02•	8.47	8.09	7.17	6.29	6.27	6.02*	6.12	6.48	7.23	7.59	8.32
Cincinati, Ohio	Standard	7.05	7.38	7.57•	7.45	7.11	6.23	5.40	5.38	5.16*	5.26	5.59	6.30	7.01	7.31
	Daylight	8.05	8.38	8.57•	8.45	8.11	7.23	6.40	6.38	6.16*	6.26	6.59	7.30	8.01	8.31
Washington, DC	Standard	6.35	7.07	7.27•	7.15	6.41	5.53	5.11	5.08	4.47*	4.57	5.29	6.01	6.31	7.00
	Daylight	7.35	8.07	8.27•	8.15	7.41	6.53	6.11	6.08	5.47*	5.57	6.29	7.01	7.31	8.00
Atlanta, Ga.	Standard	6.56	7.24	7.42•	7.34	7.07	6.26	5.49	5.46	5.29*	5.40	6.09	6.34	6.58	7.21
	Daylight	7.56	8.24	8.42•	8.34	8.07	7.26	6.49	6.46	6.29*	6.40	7.09	7.34	7.58	8.21
Miami, Fla.	Standard	6.29	6.50	7.08•	7.05	6.44	6.12	5.44	5.39	5.29*	5.41	6.04	6.22	6.37	6.52
	Daylight	7.29	7.50	8.08•	8.05	7.44	7.12	6.44	6.39	6.29*	6.41	7.04	7.22	7.37	7.52
CENTRAL TIME ZONE															
Bismarck, N.D.	Standard	7.25	8.07	8.28•	8.08	7.23	6.23	5.29	5.28	4.57*	5.05	5.46	6.28	7.12	7.52
	Daylight	8.25	8.07	9.28•	9.08	8.23	7.23	6.29	6.28	5.57*	6.05	6.46	7.28	8.12	8.52
Chicago, Ill.	Standard	6.22	6.58	7.18•	7.03	6.26	5.34	4.48	4.45	4.21*	4.31	5.06	5.41	6.16	6.48
	Daylight	7.22	7.58	8.18•	8.03	7.26	6.34	5.48	5.45	5.21*	5.31	6.06	6.41	7.16	7.48
Kansas City, Mo.	Standard	6.46	7.18	7.38•	7.25	6.52	6.03	5.20	5.18	4.56*	5.06	5.39	6.11	6.42	7.11
	Daylight	7.46	8.18	8.38•	8.25	7.52	7.03	6.20	6.18	5.56*	6.06	6.39	7.11	7.42	8.11
Amarillo, Tex.	Standard	7.08	7.37	7.56•	7.46	7.17	6.34	5.56	5.52	5.35*	5.45	6.15	6.42	7.08	7.32
	Daylight	8.08	7.37	8.56•	8.46	8.17	7.34	6.56	6.52	6.35*	6.45	7.15	7.42	8.08	8.32
Little Rock, Ark.	Standard	6.29	6.58	7.16•	7.08	6.39	5.56	5.19	5.15	4.58*	5.09	5.38	6.05	6.30	6.54
	Daylight	7.29	7.58	8.16•	8.08	7.39	6.56	6.19	6.15	5.58*	6.09	6.38	7.05	7.30	7.54
New Orleans, La.	Standard	6.14	6.38	6.56•	6.51	6.27	5.58	5.18	5.14	5.00*	5.12	5.37	5.59	6.19	6.37
	Daylight	7.14	7.38	7.56•	7.51	7.27	6.58	6.18	6.14	6.00*	6.12	6.37	6.59	7.19	7.37
MOUNTAIN TIME ZONE															
Great Falls, Mont.	Standard	7.09	7.52	8.13•	7.52	7.07	6.05	5.09	5.09	4.37*	4.45	5.26	6.10	6.55	7.37
	Daylight	8.09	8.52	9.13•	8.52	8.07	7.05	6.09	6.09	5.37*	5.45	6.26	7.10	7.55	8.37
Rapid City, S. D.	Standard	6.28	7.07	7.27•	7.10	6.30	5.34	4.44	4.43	4.15*	4.25	5.02	5.40	6.19	6.55
	Daylight	7.28	8.07	8.27•	8.10	7.30	6.34	5.44	5.43	5.15*	5.25	6.02	6.40	7.19	7.55
Salt Lake City, Ut.	Standard	6.58	7.32	7.52•	7.38	7.02	6.12	5.27	5.28	5.01*	5.11	5.45	6.19	6.52	7.24
	Daylight	7.58	8.32	8.52•	8.38	8.02	7.12	6.27	6.28	6.01*	6.11	6.45	7.19	7.52	8.24
Denver, Col.	Standard	6.28	7.02	7.21•	7.08	6.34	5.45	5.01	4.58	4.36*	4.46	5.19	5.52	6.24	6.54
	Daylight	7.28	8.02	8.21•	8.08	7.34	6.45	6.01	5.58	5.36*	5.46	6.19	6.52	7.24	7.54
Albuquerque, N.M.	Standard	6.27	6.56	7.15•	7.06	6.36	5.54	5.16	5.13	4.55*	5.06	5.35	6.02	6.28	6.52
	Daylight	7.27	7.56	8.15•	8.06	7.36	6.54	6.16	6.13	5.55*	6.06	6.35	7.02	7.28	7.52
Phoenix, Ariz.	Standard	6.46	7.14	7.32•	7.24	6.57	6.16	5.40	5.37	5.20*	5.31	5.59	6.25	6.48	7.11
	Daylight	7.46	8.14	8.32•	8.24	7.57	7.16	6.40	6.37	6.20*	6.31	6.59	7.25	7.48	8.11
PACIFIC TIME ZONE															
Spokane, Wash.	Standard	6.34	7.17	7.39•	7.17	6.31	5.29	4.33	4.33	4.01*	4.09	4.51	5.35	6.20	7.02
	Daylight	7.34	8.17	8.39•	8.17	7.31	6.29	5.33	5.33	5.01*	5.09	5.51	6.35	7.20	8.02
Portland, Ore.	Standard	6.50	7.30	7.51•	7.32	6.50	5.51	4.59	4.58	4.29*	4.38	5.17	5.57	6.39	7.17
	Daylight	7.50	8.30	8.51•	8.32	7.50	6.51	5.59	5.58	5.29*	5.38	6.17	6.57	7.39	8.18
Reno, Nev.	Standard	6.27	7.00	7.20•	7.07	6.32	5.44	5.00	4.58	4.36*	4.46	5.19	5.51	6.23	6.53
	Daylight	7.27	8.00	8.20•	8.07	7.32	6.44	6.00	5.58	5.36*	5.46	6.19	6.51	7.23	7.53
San Francisco, Cal.	Standard	6.35	7.06	7.25•	7.14	6.42	5.55	5.14	5.11	4.51*	5.02	5.33	6.03	6.32	7.00
	Daylight	7.35	8.06	8.25•	8.14	7.42	6.55	6.14	6.11	5.51*	6.02	6.33	7.03	7.32	8.00
Los Vegas, Nev.	Standard	6.03	6.33	6.52•	6.42	6.11	5.27	4.48	4.45	4.26*	4.37	5.07	5.35	6.02	6.28
	Daylight	7.03	7.33	7.52•	7.42	7.11	6.27	5.48	5.45	5.26*	5.37	6.07	6.35	7.02	7.28
Los Angeles, Cal.	Standard	6.12	6.40	6.59•	6.50	6.22	5.41	5.04	5.00	4.44*	4.55	5.23	5.49	6.14	6.37
	Daylight	7.12	7.40	7.59•	7.50	7.22	6.41	6.04	6.00	5.44*	5.55	6.23	6.49	7.14	7.37

Notes: Cities in each time zone listed from north to south

•••••• Latest sunrise within 1 minute of this time

◯ Latest sunrise in time zone

****** Earliest sunset within 3 minutes of this time

◯ Earliest sunset in time zone

Figures 4-5 to 4-12 graphically show sunrise and sunset in the four time zones. In this set of maps, lines of simultaneous sunrise and sunset are joined for hours such as 5 - 8 a.m. and 5 - 8 p.m. Standard Time, as appropriate. These figures show how sunrise and sunset move from east to west across the time zones. They also demonstrate how the angle of the sun changes from a north-south position at the equinox to a northeast-southwest position in December. The result of the changing angle of the sun is that the northwest corner of the time zone gets the sun much later than other parts of the zone, while the northeast corner of the time zone gets dark earlier than the rest of the zone.

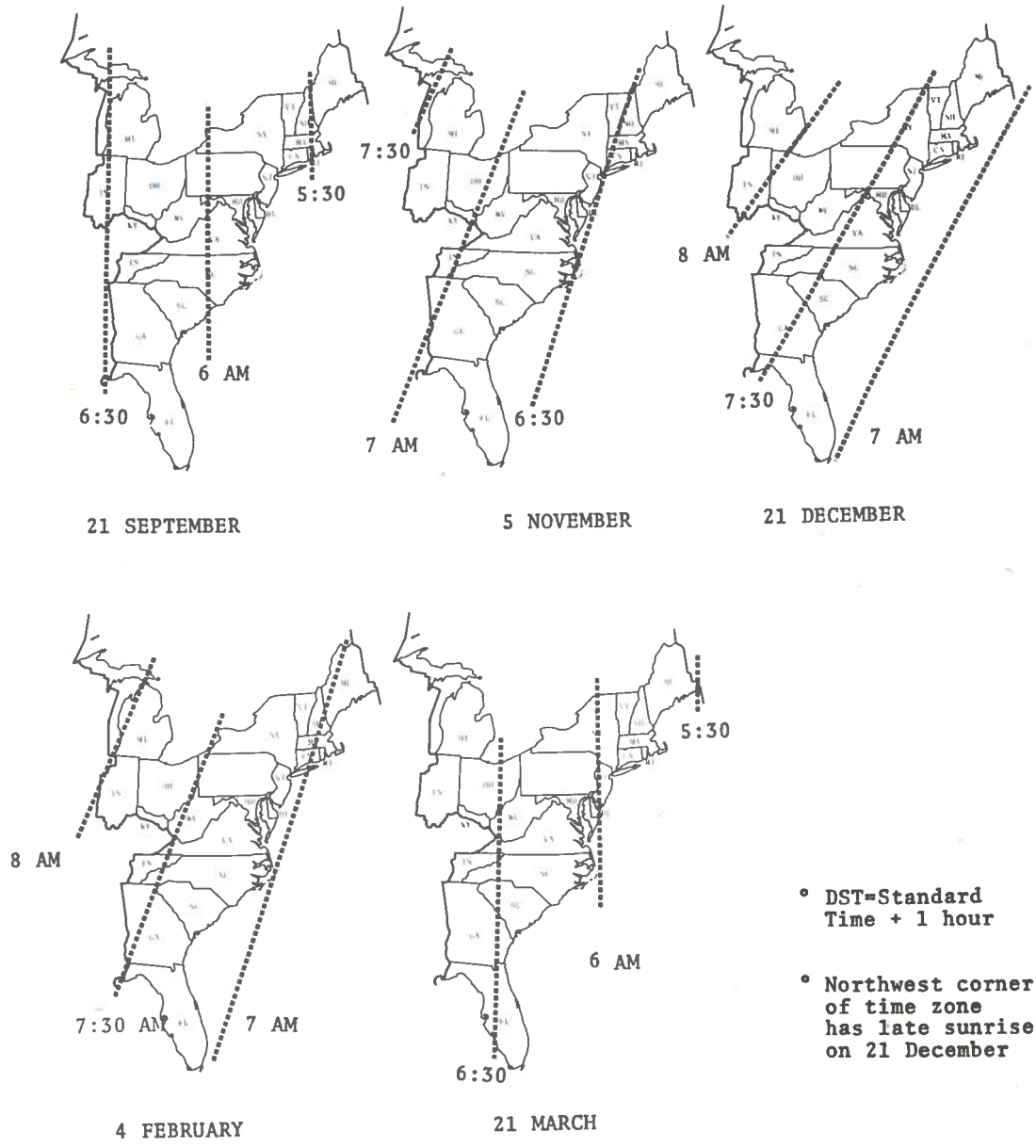

Figure 4-5 Sunrise, Eastern Standard Time

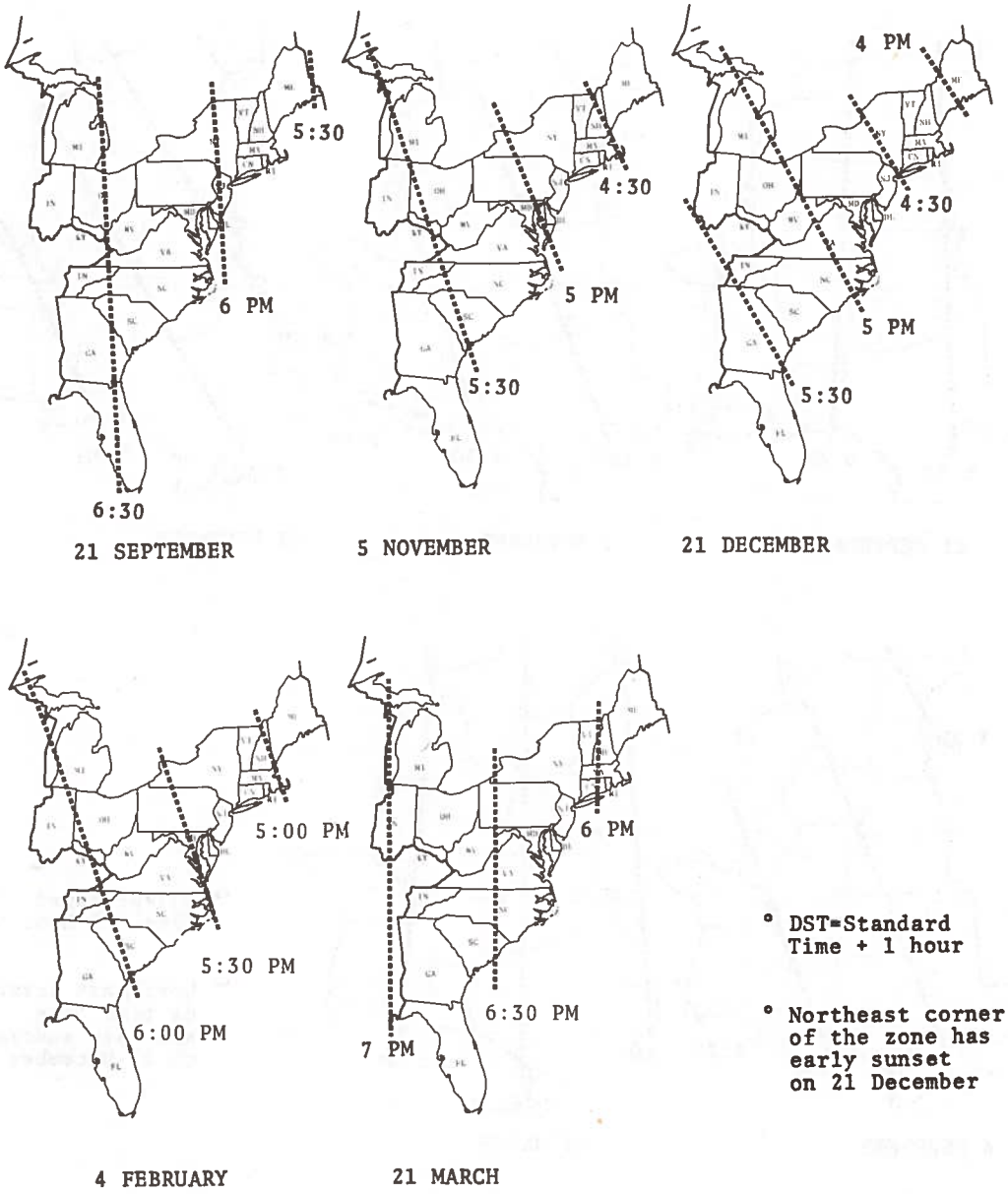

Figure 4-6 Sunset, Eastern Standard Time

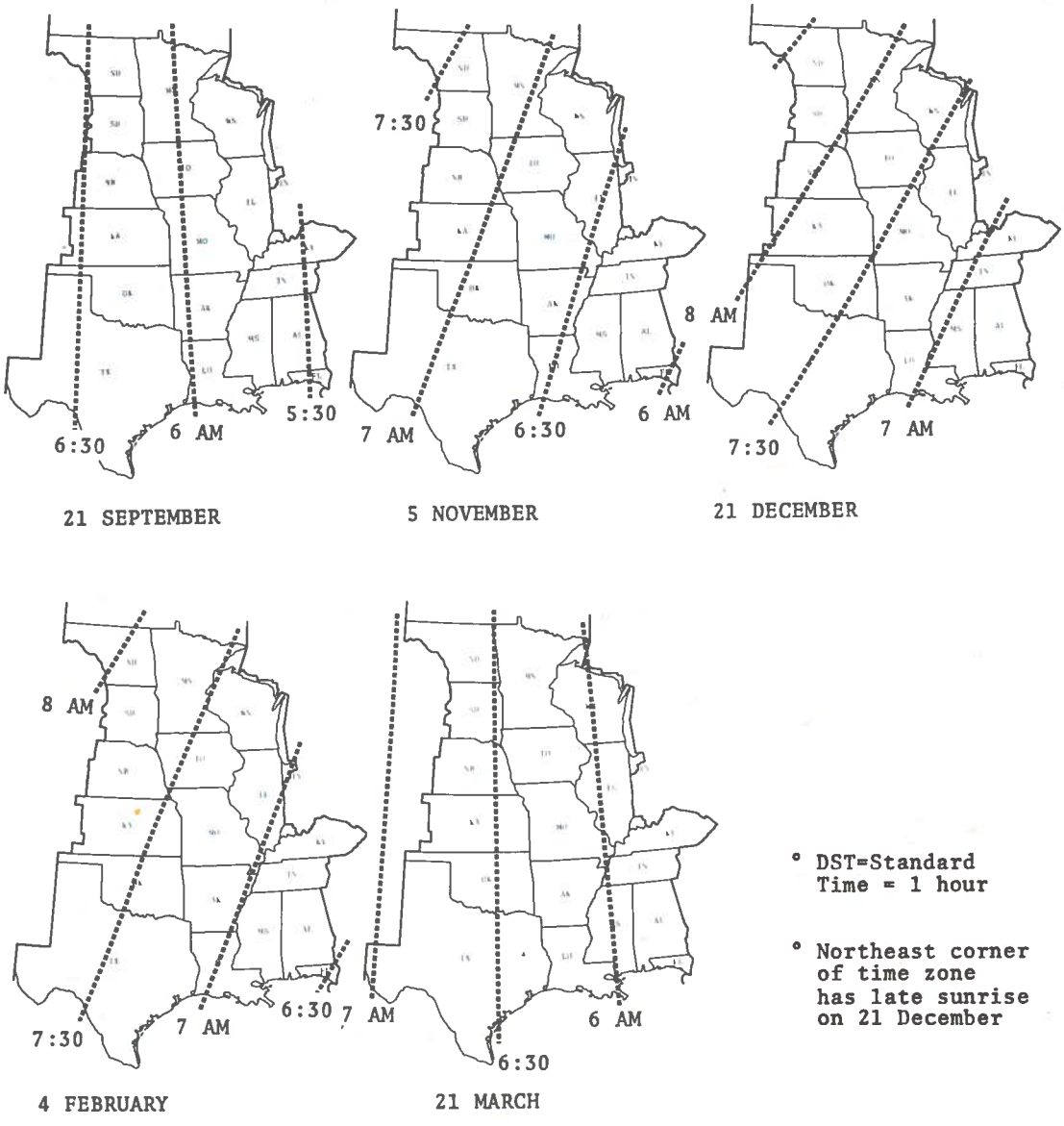

Figure 4-7 Sunrise, Central Standard Time

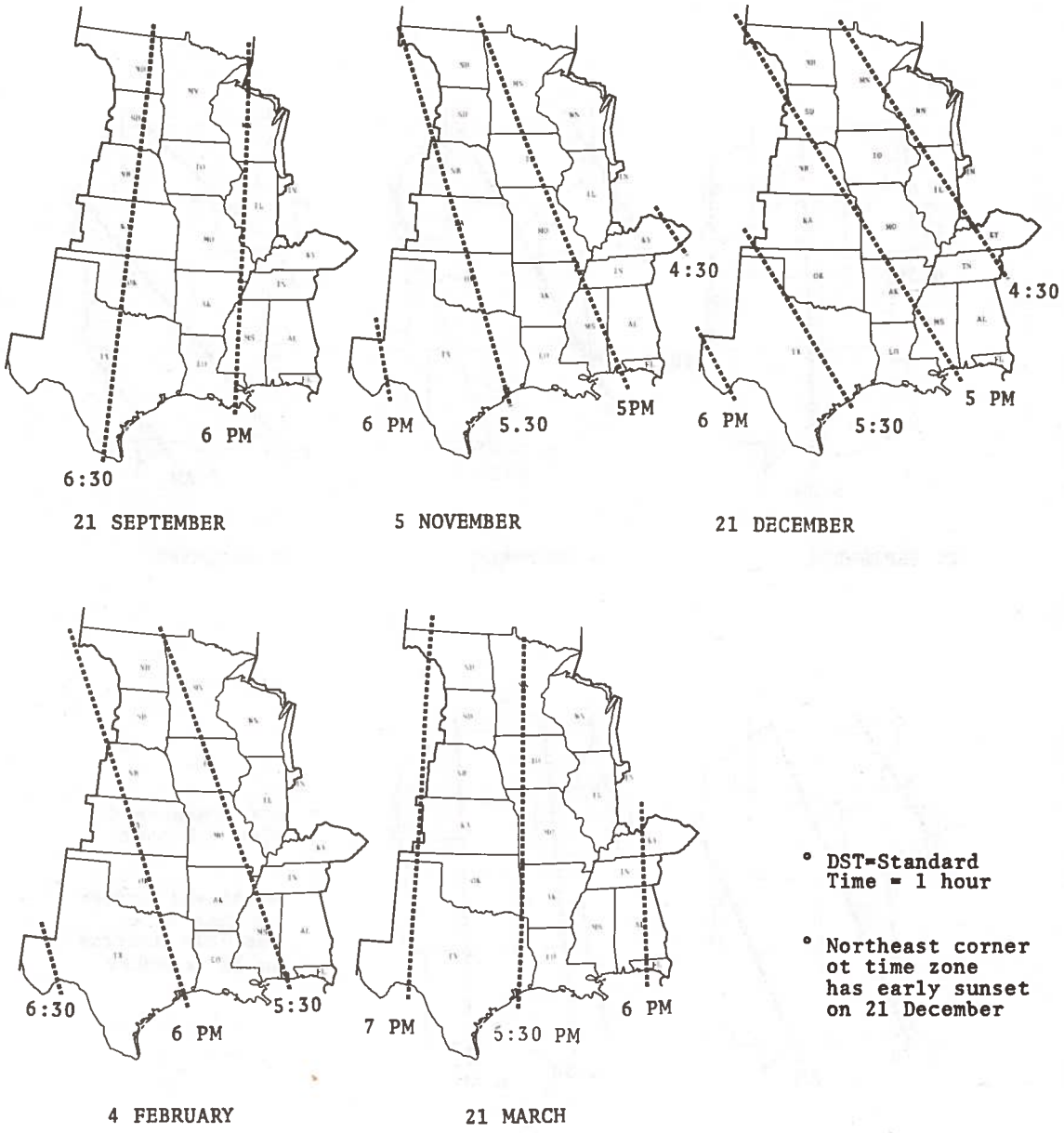

Figure 4-8 Sunset, Central Standard Time

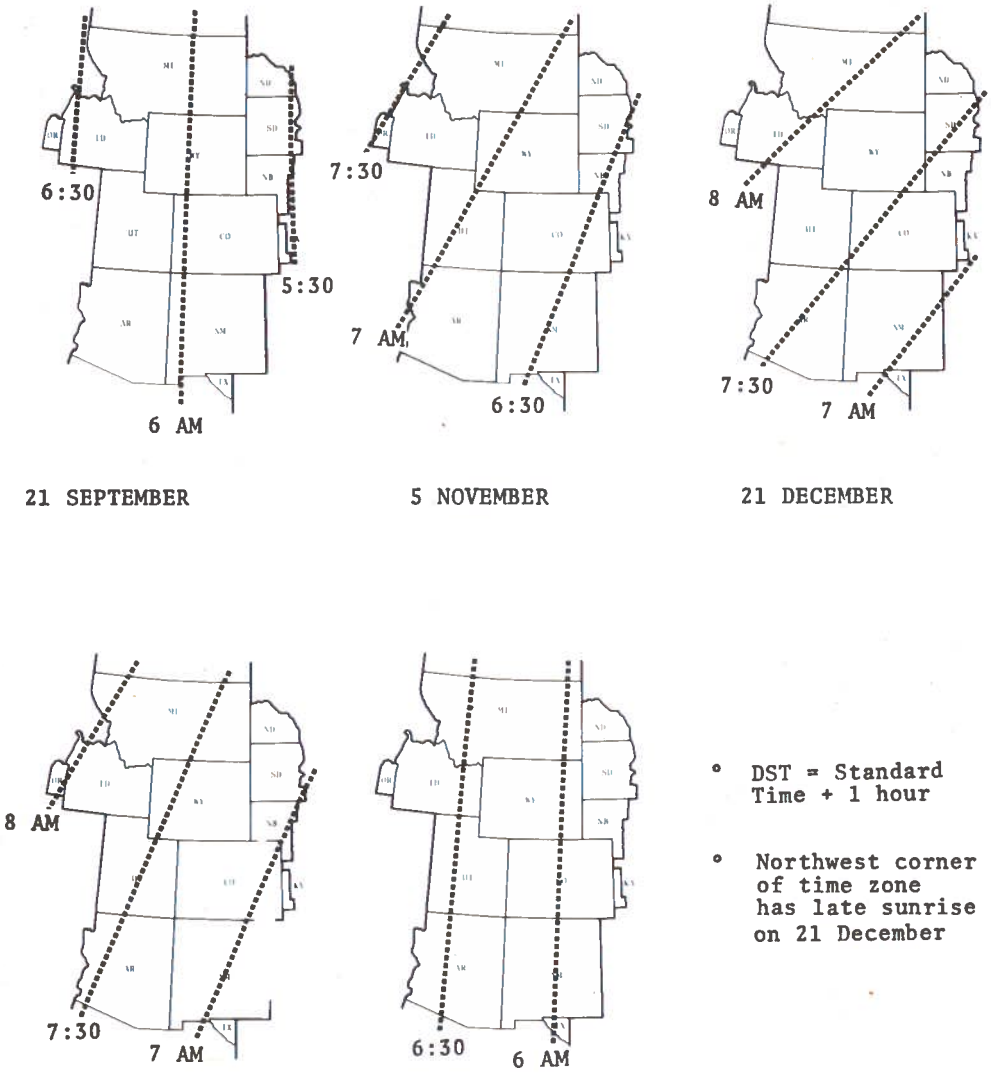

Figure 4-9 Sunrise, Mountain Standard Time

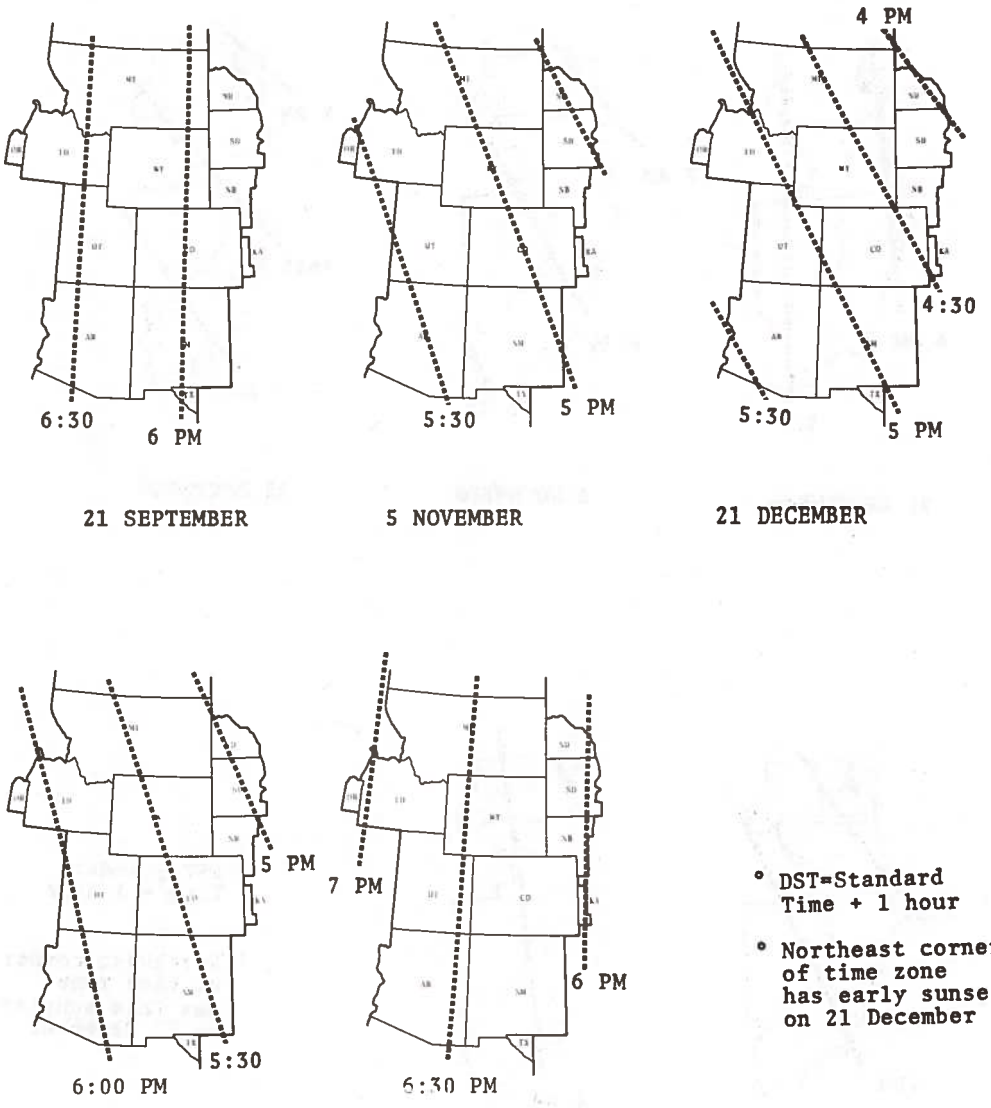

Figure 4-10 Sunset, Mountain Standard Time

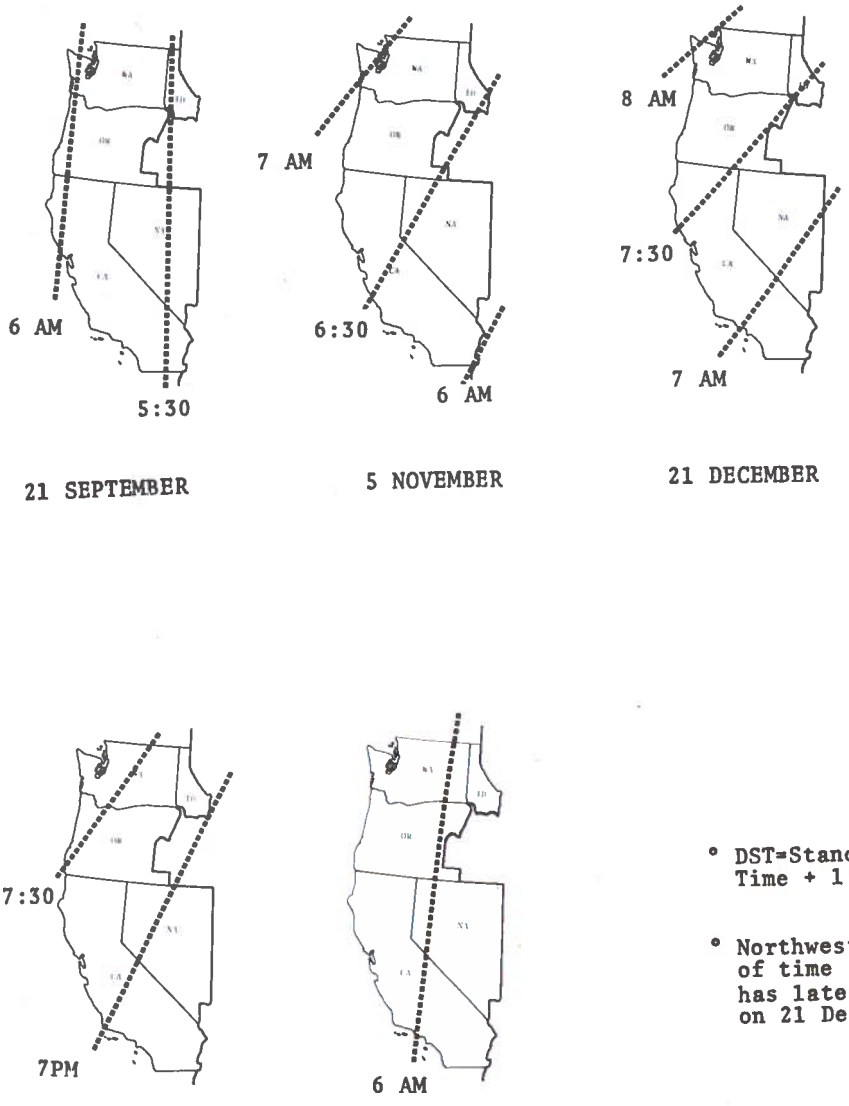

Figure 4-11 Sunrise, Pacific Standard Time

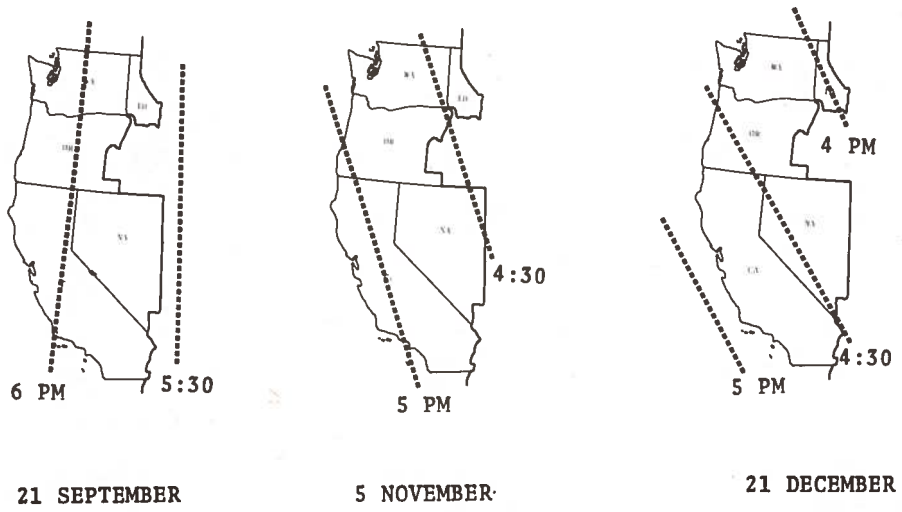

Figure 4-12 Sunset, Pacific Standard Time

5. SOCIAL SURVEY

This section contains analysis of public opinion, as measured by three different sources: (1) a DOT-sponsored survey conducted by the National Opinion Research Center (NORC), (2) the Harris Survey, and (3) solicited mail to the DOT Office of Consumer Affairs. Considered together the three sources allow a gross, but important, generalization: Daylight Saving Time is generally popular, but not in the winter months.

5.1 THE PUBLIC RESPONSE TO YRDST - NORC SURVEY

5.1.1 Introduction

This section reviews the degree to which the various segments of the U.S. population "approved" of YRDST in the fall of 1973, and "liked" YRDST in February and March 1974 after it had been in operation for a few months. Also discussed are the reasons given by respondents for approving or disapproving of YRDST.

This national survey was conducted by the National Opinion Research Center (NORC) of the University of Chicago on a monthly basis between May 1973 and April 1974. The survey covers only the conterminous U.S., thus excluding Alaska and Hawaii. Roughly 680 persons were interviewed each month. DST- relevant questions were included in six cycles of the survey, the dates of which are:

Cycle 5: August 31 - September 27, 1973 ("September")

Cycle 6: September 28 - October 25, 1973 ("October")

Cycle 7: October 26 - November 22, 1973 ("November")

Cycle 10: February 1 - 28, 1974 ("February")

Cycle 11: March 15 - April 11, 1974 ("March")

The survey's principal questions on YRDST were:

September through November, 1973

"Some people think that we should have Daylight Saving Time all year round; that is, not turning the clocks back an hour at the end of October. Would you approve or disapprove of remaining on Daylight Saving Time all year round, or don't you care one way or the other?"

December, 1973

"As you know, we recently switched from Daylight Saving Time to Standard Time. That means that it now gets light an hour earlier in the morning than before we switched over. It also means that it now gets dark an hour earlier in the evening than before we switched over. Would you prefer to be on Daylight Saving Time all year around instead of just being on it for part of the year?"

February and March, 1974

"As you know, we recently switched from Standard Time to Daylight Saving Time. That means that it now gets light an hour later in the morning than before we switched over. It also means that it now gets dark an hour later in the evening than before we switched over. How do you feel about being on Daylight Saving Time now? Would you say that you like it very much, like it somewhat, dislike it somewhat or dislike it very much?"

5.1.2 Summary

1. In September and October 1973 about half (50% and 47%) of the adult U.S. population approved of YRDST and only 25% and 26% disapproved of the concept. During the following two months with the growing threat of the energy crisis, the approval of YRDST increased.

2. One month after YRDST was instituted, 50% of the adults said they disliked it, and only 42% expressed a liking for YRDST. The primary reason for opposition to YRDST was that children have to go to school in the dark. Another month later (March), those disliking had dropped to 38% and those liking the DST had climbed to 54%. The primary reason given in favor of YRDST was people have light when they need it.

3. The approval and liking of YRDST decreases as one moves from East to West within Time Zones.

4. There appears to be a steady miniority of 35% in the farm population which approves of and likes YRDST.

5. There is no significant difference in the attitudes toward YRDST between respondents from households with and without school age children.

5.1.3 National Results

Roughly half (50%) of the American people approved of the YRDST in September 1973. At that time about a quarter (25%) disapproved, and (23%) did not care.

TABLE 5-1 NATIONAL RESPONSE TO YRDST

	Positive*	Neutral*	Negative*
September	50%	25%	25%
October	47	27	26
November	60	25	15
December	79	**	21
February	42	9	50
March	54	9	38

*To render responses readily comparable, "approve," "prefer," and "like" are included in all Tables as "positive" responses, "disapprove," "do not prefer" and "dislike" are included as "negative" responses, and "do not care" and "don't know" are "neutral" responses.

**In December, there was no "neutral" response alternative.

During November and December the approval of YRDST increased. On the November survey 58% approved and on the December survey 79% stated that they would prefer to be on YRDST.

After the inauguration of YRDST, the percent of the population which said they liked YRDST was markedly lower than the percent that had approved of YRDST prior to its institution. In February 1974 only 42% of the population stated that they liked YRDST, and 50% said they disliked it. By March, with spring approaching and the sun rising earlier, those liking YRDST had risen back to 54% of the population, with 38% disliking YRDST.

The minority who disapproved of YRDST in March were further asked: "What months would you prefer not to be on Daylight Saving Time?" Figure 5-1 shows that, of those opposed to DST year-round, fewer than 10% disapproved of DST from April through September and a majority disapproved of DST only during the four month period from November to February.

5.1.4 Major Reasons for Approving and Disapproving of YRDST

On the September and October 1973 surveys the interviewees were asked what they personally liked and disliked about YRDST and in what way life in this country might be helped or hindered by YRDST. Although the respondent groups had no overriding reason why they were in favor of or against YRDST, it is interesting to note that the prevalent reason for favoring it was that it allowed more time for social and recreational activity in the evening, while the biggest objection was that YRDST meant respondents would be getting up in the dark. Significantly, a range of 11% to 16% responded that they would not like YRDST at all. Those who claimed "There is nothing I do not like about it" dropped from a range of 41% - 58% during Septebmer - November to a meager 2% in March.

Similarly, there were no overriding reasons given as to why YRDST would be good or bad for the country as a whole. It is interesting to note the percentage who responded that YRDST "does not help life in this country at all" dropped from a range of 17% - 27% in

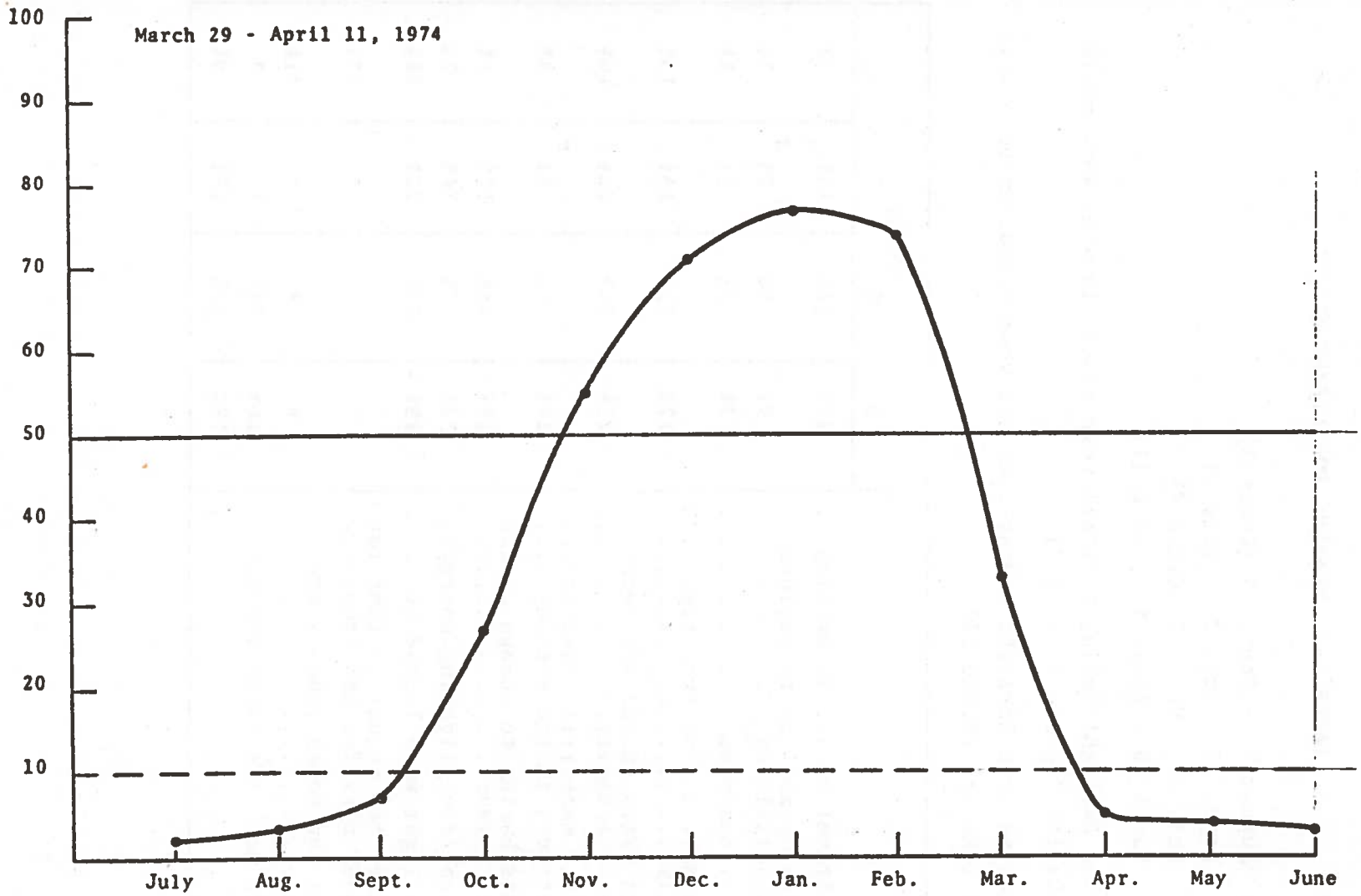

Figure 5-1 If Disapprove of Year-Round DST What Months Would You Prefer Not To Be On DST

TABLE 5-2 REASONS FOR LIKING YRDST

DATES: August 31 - Sept. 27 (Cycle 5)
Sept. 28 - Oct. 25 (Cycle 6)
Oct. 26 - Nov. 22 (Cycle 7)
March 29 - April 11 (Cycle 11)

If we had Daylight Saving Time all year round, in what ways would you like it? (Cycles 5, 6, & 7)

Now that we have Daylight Saving Time all year round, in what ways do you like it? (Cycle 11)

	Cycle			
	5	6	7	11
Makes travel easier in evening...	19%	14%	15%	9%
Improves my ability to perform work activities.....	9%	6%	9%	7%
Helps my business.....	3%	2%	1%	1%
I have more useful free time with family.....	17%	11%	13%	13%
Permits extra social and recreational activity.....	23%	20%	25%	16%
I/family member(s) feel safer on streets in the evening.....	14%	6%	8%	5%
Prevents having to change clocks twice a year.....	18%	15%	12%	6%
Saves on (fuel/lighting/energy)..	12%	7%	16%	7%
I have light when I need it.....	19%	22%	22%	39%
Increases the amount of time for outdoor play for children.....	*	*	*	13%
Changes the hours schools are open.....	*	*	*	21%
I would not like it in any way...	16%	14%	11%	*
Other.....	15%	12%	17%	9%

TABLE 5-3 REASONS FOR DISLIKING YRDST

DATES: August 31 - Sept. 27 (Cycle 5)
Sept. 28 - Oct. 25 (Cycle 6)
Oct. 26 - Nov. 22 (Cycle 7)
March 29 - April 11 (Cycle 11)

If we had Daylight Saving Time all year round, in what ways would you not like it? (Cycles 5, 6, & 7)

Now that we have Daylight Saving Time all year round, in what ways do you not like it? (Cycle 11)

	Cycle			
	5	6	7	11
Children have to go to school in dark	17%	13%	10%	38%
I get up in the dark	22%	17%	12%	22%
I/family members(s) feel less safe on the streets in the morning	5%	3%	0%	5%
Causes a delay in time when I could start work in the morning	4%	2%	1%	5%
Hurts my business	1%	1%	0%	0%
Makes travel harder in the morning	6%	4%	3%	7%
Mixes up my schedule	6%	4%	4%	5%
Religious reasons	1%	1%	0%	1%
There is nothing I do not like about it	41%	41%	58%	2%
Other	10%	12%	11%	0%
Hurts my performance on the job	*	*	*	12%
Changes the hours schools are open	*	*	*	39%

TABLE 5-4 REASONS FOR THINKING YRDST WOULD BE GOOD FOR COUNTRY

DATES: Aug. 31 - Sept. 27 (Cycle 5)
Sept. 28 - Oct. 25 (Cycle 6)
Oct. 26 - Nov. 22 (Cycle 7)
March 29 - April 11 (Cycle 11)

What about the country as a whole? In what ways do you think life in this country might be helped if we had Daylight Saving Time all year round? (Cycles 5, 6, & 7)

What about the country as a whole? In what ways do you think life in this country is helped by having Daylight Saving Time all year round? (Cycle 11)

	Cycle 5	6	7	11
Improved highway safety, less accidents	17%	9%	9%	16%
Saves electricity	19%	13%	40%	5%
Improves business	7%	5%	3%	7%
Makes trips from work faster and easier	9%	3%	2%	6%
Increases opportunities for social and recreational activities	21%	17%	12%	46%
I/We have light when we need it	14%	13%	11%	15%
Other	18%	19%	19%	8%
Does not help life in this country at all	24%	27%	17%	1%
Saves gasoline	*	*	*	0%
Saves heating fuel	*	*	*	3%
Saves (energy/fuel) (unspecified as to type of energy or fuel)	*	*	*	3%
Increases the amount of time for outdoor play for children	*	*	*	1%
Changes the hours schools are open	*	*	*	3%
Reduces crime	*	*	*	14%

TABLE 5-5 REASONS FOR THINKING YRDST WOULD NOT BE GOOD FOR COUNTRY

DATES: August 31 - Sept. 27 (Cycle 5)
Sept. 27 - Oct. 25 (Cycle 6)
Oct. 26 - Nov. 22 (Cycle 7)
March 29 - April 11 (Cycle 11)

In what ways do you think going onto Daylight Saving Time all year round might not be good for life in this country? (Cycles 5, 6, & 7)

In what ways do you think going onto Daylight Saving Time all year round is not good for life in this country? (Cycle 11)

	Cycle 5	6	7	11
Hurts farmers	10%	7%	8%	10%
Is bad for people who have to get up early	13%	10%	7%	14%
Children have to go to school in the dark	18%	11%	7%	50%
There are more accidents in the morning	6%	4%	2%	9%
Makes driving more dangerous in the morning	6%	5%	3%	7%
Hurts business	2%	1%	1%	2%
People have to change their way of living	7%	4%	3%	5%
Change is bad (unspecified)	3%	2%	1%	13%
Other	7%	8%	11%	31%
Is not bad in any way for life in this country	38%	41%	52%	6%
Changes the hours schools are open	*	*	*	0%

September - November to 1% in March. In the same period, those who responded that YRDST "is not bad in any way for life in this country" dropped from a range of 38% - 52% to 6%. Apparently, with an increased exposure to YRDST, an increasing number of people saw it as a source of both good and bad effects.

5.1.5 The Response by DST Impact Zones

Under DST, as under Standard Time, the sun does not rise and set within established time zones at the same time, but rises and sets earlier in the eastern portions of a time zone than in the western portions. To see if the attitude of people is a function of the part of the time zone in which they reside, the time zones were divided into three East-West Impact Zones. In all surveys, YRDST found the highest degree of acceptance and was best liked in the Eastern Impact Zones, and had the least degree of acceptance and was least liked in the Far Western Impact Zones.

TABLE 5-6 RESPONSE TO YRDST BY IMPACT ZONE

	East	West	Far West	North	South
Sept. - Oct.					
Positive	61%	46%	37%	55%	44%
Neutral	22	26	26	21	27
Negative	17	28	37	24	29
February					
Positive	44	40	35	37	41
Neutral	9	9	10	12	7
Negative	47	51	55	51	51

The British report on YRDST disclosed much more opposition to Daylight Saving Time in Scotland to the North than in England and Wales. In the winter, the sun rises later and sets earlier as one moves from South to North. During the summer, the reverse is true; days are longer in the North than in the South. Dividing the U.S. time zones into Northern and Southern Impact zones, the fall survey showed greater approval in the Northern than in the Southern Impact Zones. On the February survey both areas voiced the same level of dislike for YRDST; however the Southern Impact Zones had a greater proportion who liked YRDST and a smaller portion that did not care than the Northern Impact Zones.

5.1.6 The Response by Other Characteristics

A person's feeling toward YRDST is apparently based on many factors, some more important than others. Attitudes toward YRDST vary most with, or are best "explained" by, location within the East-West Impact Zones. Other variables that provide partial explanation include:

a. Place of Residence. Approval of YRDST generally is highest in the suburbs, is lowest in farm areas, and varies among cycles in other areas.

b. Age of Respondent. Approval and liking of YRDST is highest among 25-34 year olds and declines with advancing age.

c. Income of Respondent. Approval and liking of YRDST tends to increase with income, with the greatest approval in the $15,000-19,000/yr. category in September-October, and the greatest liking in the $20,000-24,000/yr. category in February.

5.1.7 Perceived Effects of YRDST

Most people sampled felt that they were not doing anything different in the evenings because of the extra hour of daylight. Only 25% perceived any change in their evening activities. Of these, the largest number used the extra daylight for additional recreation (32%) and outdoor work around the house (24%). It is interesting to note that the number who felt their late afternoon driving had decreased was larger than those who indicated an increase. That this is more likely attributable to gasoline shortages than to YRDST is suggested by the indicated increases in recreation and shopping activities.

The media have given much attention to early morning accidents involving school children, since the inauguration of YRDST. Asked if such accidents were caused by the extra hour of darkness in the morning, fully 71% of the respondents thought they were. Fifty six percent felt that YRDST should be discontinued next winter because of the perceived threat to school children's safety. Although the survey indicates the existence of a firm causal connection in people's minds between morning darkness and school children's safety, that causal connection may result from the efficacy of the media in shaping attitudes rather than from any real world factual basis. When asked "have children in your community been having any extra problems this winter getting to school safely in the morning?" only 19% responded "yes", while 70% responded "no". Obviously, the causal connection between morning darkness and school children's safety is considerably lower when the question is worded ("your community") to increase the respondents' dependence on direct experience. Significantly, respondents from households with school age children (5-17 years of age) did not show an appreciably different attitude toward YRDST than respondents from households without school age children.

TABLE 5-7 DOING THINGS DIFFERENTLY SINCE ADOPTION OF YRDST

DATES: March 15 - April 11

Since we went back onto Daylight Saving Time, have you been doing anything different in the evening due to the extra hour of daylight?

Yes.....	26%
No.....	74%

IF YES:

What have you been doing different in the evening since we went back onto Daylight Saving Time?

Been leaving work later.....	15%
Been using public transportation more...	0%
Been walking more.....	8%
Been doing more (errands/shopping) in the late afternoon.....	10%
Been going out more for recreation in the late afternoon.....	32%
Been doing more outdoor work around the house.....	24%
Been doing more indoor work in the house.....	10%

Would you say that you are now driving more, less, or about the same amount in the late afternoon as you were before we went back onto Daylight Saving Time?

More.....	13%
Less.....	25%
About the same.....	54%
N.A. [R DOES NOT (GENERALLY) DRIVE].....	8%

TABLE 5-8 YRDST AND SCHOOL CHILDREN SAFETY

DATES: March 29 - April 11

There have been some accidents involving children on their way to school this winter. Some people think that such accidents were caused by the extra hour of darkness in the morning that winter Daylight Saving Time brought. Others think such accidents would have occurred even if we were not on Daylight Saving Time. Which view comes closest to your way of thinking?

Such accidents were caused by the extra hour of darkenss in the morning.....	71%
Such accidents would have occurred even if we were not on Daylight Saving Time.....	29%

Do you think that we should go off Daylight Savings Time next winter because some people have been concerned about the safety of children on their way to school in the morning?

Yes.....	56%
No.....	44%

As far as you know, have children in <u>your</u> community been having any extra problems this winter getting to school safely in the morning?

Yes.....	19%
No.....	70%
Don't know....	11%

<u>IF YES</u>:

Do you think these extra problems were because of the additional hours of darkness in the morning?

Yes.....	98%
No.....	2%

5.2 THE PUBLIC RESPONSE TO YRDST - HARRIS SURVEY

In late March 1974 the Harris Survey asked a question about YRDST that was similar to a question on NORC's Cycle 11 (March 29 - April 11, 1974). The responses from the two surveys, however, were quite different. The two questions and their responses are found in Table 5-9.

The reasons for the differences in the two surveys cannot be determined with any degree of certainty. Certainly part of the difference may result from sampling variations and standard error. The overriding reason for the difference, however, probably stems from the fact that the questions are more dissimilar than they seem at first glance. It is entirely conceivable that a person could consider it a bad decision "to go to Daylight Saving Time year-round in order to save fuel" and still approve of YRDST. The difference between the surveys may just indicate that people don't think YRDST does much for fuel conservation, but they approve of it for other reasons. That the Harris Survey interviewees thought there were gains in fuel consumption attributable to YRDST is indicated in Table 5-10. Asked why they felt the way they did about YRDST, only 6% indicated that it saved energy, whereas 30% gave responses that suggested no energy savings or increases in energy consumption. Since the Harris Survey question included a tight link between YRDST and energy conservation, it is not surprising that a large number concluded YRDST to be a bad decision.

5.3 THE PUBLIC RESPONSE TO YRDST - MAIL ANALYSIS

In an effort to get a better understanding of popular opinion about YRDST, DOT's Office of Consumer Affairs solicited opinions in a number of localities nationally through news releases and spot radio announcements. Although responses to such solicitations are of <u>extremely</u> low reliability as an index of public opinion, the letters indicate reasons why individuals and groups, motivated enough to write, like or dislike YRDST.

TABLE 5-9 COMPARISON OF NORC AND HARRIS SURVEYS

Questions:

Harris Survey, late March 1974:

"In your opinion, was the decision to go to Daylight Saving Time year-round in order to save fuel a good decision, a bad decision, or neither good nor bad?"

NORC Survey, March 29 - April 11, 1974:

"As you know, the United States Congress put our country back onto Daylight Saving Time this winter as part of a two-year experiment to try to save energy. Some people think that we should continue to have Daylight Saving Time all year round, that is, not turn the clocks back at the end of next October. Would you approve or disapprove of remaining on Daylight Saving Time all year round next year, or don't you care one way or the other?"

Harris Survey		NORC Survey	
Good Decision	19%	45%	Approve
Bad Decision	43	37	Disapprove
Neither good nor bad	32	16	Don't care
Not sure	6	2	Don't know

HARRIS SURVEY

TABLE 5-10 BEHIND PEOPLE'S VIEWS ON DAYLIGHT SAVING

	Total Public %
Why Bad Decision	
School kids endangered	24
Use more electricity in AM	11
Hate getting up in dark	7
Use lot of fuel in AM	2
Use cars to take kids to school	1
Why Good Decision	
Like daylight saving time	7
Gain an hour at day's end	6
Saves energy	6
Why Neither Good Nor Bad	
Didn't save any energy	16
No difference at all	11
Doesn't affect us	6
Not sure	3

Responses were divided into four categories: individuals; businesses, consumer groups and organizations; petitions with signatures; and ad hoc polls. Letters signed by five or more individuals were classified as petitions with signatures. Some letters read, in effect, "I asked around at work and found X for, Y against, and Z undecided about Daylight Saving Time"; these were classified as ad hoc polls. Table 5-11 summarizes the responses.

Reasons individuals gave for liking YRDST are presented in Table 5-12. The four reasons cited most often in the letters also show up in the top four in one or another of the NORC surveys (Table 5.2). The reason given most often (more time for recreation and shopping) is also consistently at or near the top of NORC's lists. This list and NORC's are, in this respect, mutually supportive.

Altogether 3061 individuals wrote objecting to YRDST, Table 5-13 shows that well over one-third of these based their objection on the feeling that there were minimal or no energy savings or that YRDST actually increased energy use. This response was not among the NORC responses, but the Harris Survey also found this to be a prevalent feeling (Table 5-10). Significant numbers also wrote in expressing concern about school children's safety and difficult travel conditions in the morning; or -- two complaints that consistently appeared in the top four in NORC's survey (Table 5-3).

Tables 5-14 and 5-15 give major reasons groups, organizations and businesses like and dislike, respectively, YRDST. The tables are especially interesting in that, taken together, they reveal different perceptions of YRDST impacts, but a uniform value structure. The major reason for liking or disliking YRDST was its energy effect, positive or negative. Also in the top five reasons were: it helps/hurts business; school hours can be adjusted/school children have to go to school in dark; and YRDST is advantageous for recreation and shopping/causes inconvenience for people.

TABLE 5-11 SUMMARY OF MAIL RESPONSES

	For YRDST		Against YRDST*		Undecided	
Responses	No.	%	No.	%	No.	%
Individuals	1932	39	3061	61		
Business, Consumer Groups, Organizations	186	49	194	51		
Petitions with Signatures	1144	31	2552	69		
Ad Hoc Polls	1502	49	1415	46	161	5

*Against Group consists of following:

Number of individuals/groups opposed specifically to YRDST

Number of individuals/groups opposed to DST (not specific if opposed to YRDST)

Number of individuals/groups in favor of Summer DST/Winter Standard

Number of individuals/groups in favor of year-round Standard Time.

TABLE 5-12 REASONS INDIVIDUALS LIKE YRDST

Reason	Frequency
Light afternoons advantageous for leisure activities/shopping	328
Saves/may save energy	303
Makes travel safer/easier in the evening	164
School schedules can be adjusted	139
Reduces crime/streets are safer to walk	57
Eliminates problem of changing clocks/switching time back and forth	54
More playtime for children	53
Psychological lift/morale booster	36
Helps business/commerce/industry	31
Like YRDST but concern for children	21
Can cope with darkness better in morning than in late afternoon	20
Improves ability to perform work activities	18
Permits more free time with family	14
Farmers can adjust	10
Other	21

TABLE 5-13 REASONS INDIVIDUALS DISLIKE YRDST

Reason	Frequency
Energy savings minimal/none/use more	1319
Children have to go to school in dark	1025
Causes hardships/inconvenience for other people	285
Makes travel harder in mornings	248
Increases traffic accidents	179
Hardship for farmers	166
Don't like getting up in the dark	152
Mixes up my schedule/family schedule	113
Children have to be driven to school, previously walked	107
Doesn't help anything	78
Increases crime	73
Tampering with God's time/Mother Nature	63
Hurts business/commerce/industry	37
Dangerous for pedestrians waiting in dark for rides	32
Other	133

TABLE 5-14 REASONS GROUPS, ORGANIZATIONS, AND BUSINESSES LIKE YRDST

Reason	Frequency
Saves/may save energy	44
Light afternoons advantageous for leisure activities/shopping	27
Helps business/commerce/industry	26
Makes travel safer/easier in the evening	19
School schedules can be adjusted	11
Other	43

TABLE 5-15 REASONS GROUPS, ORGANIZATIONS, AND BUSINESSES DISLIKE YRDST

Reason	Frequency
Energy savings minimal/none/use more	117
Children have to go to school in dark	84
Causes delay in starting work in morning	33
Causes hardships/inconvenience for other people	25
Hurts business/commerce/industry/restaurant	24
Other	109

6. EFFECTS OF YRDST

The effects of YRDST have been categorized in three broad areas: energy effects, community effects, and industry and commerce effects. Generally speaking, effects in the latter two categories were not discernible, if, in fact, there were any. Among community effects, no changes could be determined in traffic accident rates, school children's safety, crime rates, or the utilization of parks and recreation areas. Only the indirect effects of changes in school hours could be documented. There were also no quantifiable effects in industry and commerce, although two industries, outdoor construction and AM radio broadcasting stations were adversely affected.

Effects were found, however, in the complicated area of energy consumption. The energy section will address YRDST effects on demand for electricity, gasoline, and heating. The clearest results are developed in the electricity analysis in which savings of electricity are found. The heating analysis was largely inconclusive because of inadequate data but could be a significant factor in determining the net energy effects of YRDST. The travel analysis indicates that there may have been some small effects which increased gasoline use as a result of YRDST.

Since YRDST took place in a context of petroleum shortages and allocation, we can be sure that YRDST did not increase the use of petroleum where shortages were severe. If there were any effects in these areas they would only affect the distribution of use for last winter. Where shortages were not severe (such as in Texas), it is possible that gasoline use may have increased last winter as a result of YRDST.

Also, the results of the analysis of the effects of YRDST for last winter cannot be extrapolated intact in considering the potential effects of YRDST in future winters when gasoline supply may not be constrained.

In the Electricity Section, analysis is presented which indicates that YRDST may result in reduced electricity demand of 0.75 to 1.0%. The predominant fuel saved is coal.

The section on travel will address the travel effects for last winter and the indicators of gasoline use for fall and spring daylight saving time transitions for other years.

Finally, the section on heating will describe the ways in which YRDST could influence changes in heating requirements which could be significant in determining the net YRDST energy effects. Unfortunately, information needed to determine what the detailed effects would be was not available.

6.1 ELECTRICITY

6.1.1 Conclusions

Potential energy savings resulting from the impact of DST on electricity during the winter months are concentrated in two areas: 1) a reduction of residential lighting requirements; and 2) "peak shaving*".

The analyses indicate that YRDST probably reduces electricity demand during the winter months, and that the saving amounts to approximately 1%. The saving results from the systematic effects of reduced residential lighting requirements for a 24-hour period. Energy savings are evident in both the "Before and After" studies for the January 1974 DST transition and in the historical comparison of electricity consumption for both the spring and fall transition periods.

*Peak shaving is the process of spreading out the maximum demand for electricity to reduce the cost of supplying it.

There is also evidence of a peak-load demand reduction ("peak shaving"). The energy savings due to "peak shaving" could not be quantified due to lack of data. However, some savings are indicated because of an apparent flattening of the demand curve during peak-load hours.

In 1974, YRDST possibly resulted in a flattening of the daily peakloads and a decrease of approximately 0.75 percent in electricity consumption for January and February, as determined by an analysis of last winter's experience. For March and April, a reduction of approximately 1 percent in fuel consumption (predominately coal) for electricity production is inferred from the experience for the April to May daylight saving time transitions in previous years.

6.1.2 Effects of Daylight Management on Electricity Consumption

The major effect of YRDST upon electricity consumption appears to be upon electric illumination demand. Another possible effect, fluctuation of electric heating requirements, is unknown.

Electricity illumination demand is derived from three major sources: 1) residential lighting; 2) industrial lighting, and 3) street lighting.

Street lighting has no direct effect on energy requirements because lighting is used during hours of darkness only and, of course, DST does not affect the actual number of hours of darkness during a 24-hour period.

Industrial lighting appears to have no obvious effects on illumination requirements and could be affected either positively or negatively, depending on local work hours and lighting conditions.

This discussion will be limited to the effects of residential lighting on illumination requirements.

6.1.2.1 Residential Requirements - Advancing the clock by one hour (DST) frequently results in exactly one hour of reduced residential lighting load in the evening, and it sometimes increases lighting loads by as much as one hour in the morning.

This asymmetry in residential lighting load change between morning and evening, as a result of using DST in place of Standard Time, occurs because bedtime nearly always follows sunset throughout the year for most households in the U.S.; however, morning rising time may or may not precede sunrise. This assumes that residences use electric lighting after sunset and before bedtime in the evening and until sunrise if the family rises before dawn.

Since most households rise after sunrise in the summer, DST almost always reduces illumination requirements by one hour. However, during the winter, when there is a shorter daylight period, people's rising habits often result in a full extra hour (or fraction of an hour) of required lighting in the morning. This is especially true on weekdays, when rising times are determined principally by work-starting times.

Regional variations show that households in the northern and western parts of the time zones have the latest winter sunrises and thus the least illumination reduction. Conversely, households in the southern and the eastern parts of time zones will realize the greatest savings in residential lighting load.

To summarize, assuming that household bedtime and rising patterns for weekdays are mainly controlled by work start times, which do not vary (at least in the short run) with the change from Standard Time to Daylight Saving Time, then the following general statement is true: The saving in residential lighting load due to DST is apt to be maximized in the summer months and minimized in the winter months, with the fall and spring months intermediate between the two. This pattern is true whether measured by expected absolute or percentage load reductions. The saving is greatest in the southeastern parts of time zones and least in the northwestern parts of time zones.

6.1.3 Before and After DST Transition Studies

A number of studies which attempt to isolate the impact of DST on electricity consumption are described below:

a. Comparison of consumption before and after January 6, 1974. Two methods are used: 1) comparison of electrical utility data normalized for temperature variations; and 2) the Equivalent Day Approach. Using each method, two comparisons are made: 1) 2-5 January 1974 vs. 9-12 January 1974, and 2) 7 January - 3 February 1973 vs. 6 January - 2 February 1974.

b. Comparison of historical electricity use data before and after the fall and spring DST transitions, 1963 - 1972.

The principal data source for these studies was information provided by the Federal Power Commission (FPC) for 22 electrical utilities.

6.1.3.1 Four-Day Comparison of Consumption "Before and After" January 6, 1974 - Hourly electric load data were obtained for 22 electrical utility systems for two 4-day periods in January 1974 in order to ascertain the effects of YRDST. The systems surveyed accounted for approximately 52% of the total electrical energy output for the 48 contiguous states and were geographically representative of the U.S. The two 4-day periods chosen were 2-5 January and 9-12 January, 1974, the Wednesday through Saturday periods immediately prior to and immediately after DST was instituted. The electric load data were temperature corrected to attempt to eliminate any electric load differences between the two periods which were caused by differences in electric heating load.

The results of the analysis are as follows:

1. Nationally, there was an estimated temperature-corrected overall reduction of 0.87% in electricity consumption following the introduction of DST.
2. Each day during the period 9-12 January showed a national reduction of energy consumption as compared to the corresponding day during the 2-5 January period.
3. Although the average electricity consumption was reduced after the transition, the total number of systems showing an increase in electricity consumption slightly outnumbered the systems showing a decrease.
4. The data showed no clear geographical pattern of consumption variation.

5. There was no uniform reduction or increase pattern for any particular system.

6.1.3.2 Four-Day Equivalent Day Analysis of Consumption "Before and After" January 6, 1974 - The temperature-corrected data for 22 electric utilities were analyzed using the Equivalent Day Approach. The Equivalent Day concept is discussed in Volume II. Essentially, it is a method to separate out lighting from non-lighting effects.

The following is the result of that analysis:

1. Nationally, there was an estimated reduction due to YRDST of 0.74% in electricity consumption demand after YRDST was introduced.
2. All systems showed an overall decrease in electricity consumption, ranging from 0.03% to 1.66%.
3. Each of the four daily comparisons showed a reduction in demand after YRDST was introduced.

6.1.3.3 28 Day Comparison of Consumption "Before and After" January 6, 1974 - Hourly electric load data were obtained for the same 22 electrical utility systems for two 28-day periods, one without and one with YRDST. The periods chosen were 6 January - 2 February 1974 (the period immediately after YRDST was instituted) and 7 January - 3 February 1973 (the corresponding 1973 period). The electric load data were temperature corrected to attempt to eliminate any electric load differences between the two periods which were caused by differences in weather.

The results of the analysis are as follows:

1. Nationally, the overall electricity consumption was estimated to be 4.56% lower in the 1974 YRDST period than in the corresponding period of 1973. The 4.56% decrease found is probably largely due to causes other than YRDST, especially 1974 conservation.
2. Each day during the 1974 period showed a national reduction of energy consumption as compared to the corresponding day of the 1973 period.

3. The total number of systems showing a decrease in electricity consumption slightly outnumbered the systems showing an increase.

4. The data showed no clear geographical pattern of consumption variation.

5. There was no uniform pattern of reduction or increase for any particular system.

6.1.3.4 28-Day Equivalent Day Analysis of Consumption "Before and After" January 6, 1974 - The temperature-corrected data for the 22 electric utilities were then analyzed using the Equivalent Day Approach. The analysis showed the following:

1. Nationally, the overall electricity consumption was estimated to be 0.73% lower due to YRDST in the 1974 YRDST period than in the corresponding period of 1973.

2. Fifteen systems showed an overall decrease in consumption and three systems showed an increase. (There were no data available for four of the systems.) The "change" ranged from +1.57% to -1.39%.

3. Twenty-seven of the twenty-eight daily comparisons showed a reduction in demand due to YRDST.

6.1.3.5 Analysis of Electricity Use for Fall and Spring Transitions Historical electrical consumption data were analyzed by comparing the weeks before and after the fall and spring transitions of DST. The results showed that during the spring transitions, there was a decrease in electricity consumption after DST was instituted for six of the ten years analyzed (1963-72), with an overall average reduction of .6% for the ten-year period. The fall transitions showed an increase in electricity consumption following the reinstatement of Standard Time in all of the ten years surveyed, with an overall average increase of 1.50% for the 10-year period.

This analysis indicates a positive effect of DST on electricity savings. However, the actual effect caused by the extra hour of daylight during the evening during DST can not be isolated from the change in consumption due to temperature variation caused by warmer or colder temperatures during the transition periods. A comparison of the above changes against the weekly trends shows an electrical savings on the order of 1%. This saving was inferred only for the months of March and April.

6.1.3.6 "Peak Shaving" - In the electrical utility industry, fuel efficiency is reduced during peak demand hours because less efficient generators are used. These generators are made specifically to handle peak loads and are shut down for the remainder of the day. (Their lower capital cost outweighs the additional fuel costs of operating them.) Thus, a reduction in daily peak-load (i.e., "peak shaving"), even if total daily demand remains constant, will result in an overall savings of energy, although the savings could not be quantified due to insufficient data.

Year Round Daylight Saving Time (YRDST) could cause "peak shaving" to occur. Peak demand during the winter months occurs for most power companies between 5-6 p.m. Theoretically, an additional hour of daylight in the early evening during the winter months (as under YRDST) would allow households to switch on their lights (and possibly their televisions, etc.) an hour later. In addition, street lighting requirements would be shifted by an hour. Since the time many industrial plants and businesses cease operation would not change, the requirements caused by industrial machinery, lighting, etc. might not coincide with the maximum power usage by the households which occurs at darkness. Therefore, there appears to be potential for a reduction in peak-load demand. Twenty-two electrical utility systems were surveyed (by the Federal Power Commission) to determine if there was any obvious shift or reduction in peak-demand load. The data from the electrical utilities

were analyzed to determine the effects of YRDST before and after January 6, 1974. The data indicated the following:

1. The peak load for ten of the reporting systems shifted from evening to morning. The change was especially noticable on systems in the Northeast and Southwest regions.
2. Thirteen systems had lower peak demands after YRDST.
3. The peak load was reduced in 19 of the 22 systems.
4. The evening peak load occurs at least one hour later for 19 systems. This can be attributed to the direct effect of shift in illumination requirements.

It appears reasonable to state that the daily peaks have been decreased because of YRDST, and although the overall fuel savings can not be measured, there appears to be evidence that there is potential for more efficient generating utilization during the winter months due to YRDST.

6.1.4 Other Special Studies

The following is a brief summary of the findings of other studies conducted to determine the effects of DST on fuel consumption. These results are limited to comments concerning electricity and are applicable only to the Northeastern part of the country.

6.1.4.1 Boston Edison Company (BEC) - The Boston Edison study, dated February 14, 1974 concluded that;

1. BEC demand was estimated to be reduced annually by 0.2% because of YRDST:
2. The shift of street lighting demand coupled with decreased customer usage would act to depress BEC's hourly demand between 4 and 8 p.m. between 25 and 80 MW (megawatts).

In addition, BEC comparisons of 1973 vs. 1974 show a peak shift caused by peak shaving.

6.1.4.2 Commonwealth Edison - A Commonwealth Edison Company information memo dated January 30, 1974, titled "Daylight Savings Time," concluded that DST would result in a net output reduction of approximately 45 million kilowatt hours per year or 5 million gallons of oil. The estimate is based on a projected reduction of 75 million kilowatt hours during the lighter evening hours, but this would be offset by about 30 million kilowatt hours of increased use during the darker morning hours.

6.1.4.3 New England Power Planning (NEPLAN) - The NEPLAN study dated April 12, 1974, produced the following results:

1. No effect on daily demand as a result of change to daylight saving time in January.
2. A decrease of 550 MW in the 5-6 p.m. load and an increase of 450 Mw in the 10-11 a.m. load with a net decrease in daily peak load of 25 to 50 MW as a result of the change to DST.

6.2 GASOLINE

This section of the report will address the effects of YRDST on gasoline consumption for January through April 1974.

6.2.1 Conclusions

Total travel and gasoline use in the U.S. was generally reduced for the winter months of 1973/1974 compared to the winter months of 1972/1973. However, YRDST may have resulted in a very small increase in travel and gasoline use in January and February in a few southern states where the weather was warm and where gasoline supply was not highly constrained last winter. In those states in which gasoline was constrained last winter, YRDST did not increase gasoline use. In March and April, when gasoline supplies were more available but still constrained and much largers of the country were warm, YRDST may have increased gasoline

use in the range of 0.5 to approximately 1.0 percent over the amount forecast under conditions of standard time.

6.2.2 General Considerations

Several considerations bear on the evaluation of the gasoline effects of YRDST.

Small increases in gasoline use resulting from YRDST would be significant since they would offset the minimal saving of oil associated with the saving of electricity described in the section on electricity. These small effects are difficult to reliably discern against the background of other changes last winter, e.g., shortages of gasoline, speed limits, and Sunday closings. The strategy for dealing with this problem of discerning small effects for this period will involve analyzing a broad pattern of indicators for significance and consistency.

A further consideration during last winter (January through April 1974) is that in some regions of the country there were significant gasoline supply constraints; thus, YRDST could not have increased gasoline use, although it could have influenced the daily pattern of use. However, there were some states in which gasoline supply constraints were not a strong factor. For example, Texas and Louisiana had supplies in January and February approximately equal to the supplies of the previous year. For the period of YRDST from January through April, 1974 there may have been some gasoline use effects in these states.

Travel is an important factor in analyzing the effects of YRDST because the amount and type of travel and the fuel efficiency of vehicles determines the use of gasoline.

Travel effects of YRDST involve short, local trips rather than long trips since only an extra hour of daylight is gained in the evening. These potential extra short, local trips are especially significant because auto fuel efficiency is significantly lower for them than for longer trips and therefore, if they do exist, we would expect that there would be larger percentage increases in gasoline use for each percentage increase in travel activity.

The determinants of the demand for travel are not known with certainty. However, it is known that personal income and weather are significant factors in determining the demand for travel. At most, it is expected that daylight would be a small factor in the demand for travel. No reliable theory presently exists which explains the demand for travel accurately enough to analyze the subtle potential effects of YRDST. Future research may reveal this relationship.

6.2.3 Behavioral Hypothesis Relating DST to Gasoline Use

The key behavioral hypothesis associated with YRDST and gasoline use is that it is plausible that people would use the daylight in the early evening hours for extra travel, particularly where and when the weather is warm. This situation may exist in a narrow band at the southern edge of the country in the winter and would spread north as the spring advances. If this behavioral hypothesis is true, it would imply larger gasoline use effects in the summer and smaller in the winter with the fall and spring intermediate between the two.

6.2.4 Indicators of Travel Effects

Broad patterns of indicators are presented below and suggest but do not definitely prove that extra gasoline consumption could

occur under YRDST. While each individual indicator is "soft" in terms of its reliability (surely it is possible that each one could have arisen either randomly or due to another pattern of causes that are not understood which are unrelated to Daylight Saving Time), taken as a pattern they are internally consistent and could be largely "explained" by inferring that there are some travel effects.

The indicators showing a consistent pattern with a significant travel effect are:

1. Travel in five states for the early evening period (6:00 to 8:00 p.m.) was up after the DST transition of January 6, 1974 as compared to before that transition while travel for the whole day was generally down. Furthermore, the travel increase this year (1973-1974) for the same two hour period was in excess of the increase in travel experienced last year. This increase in evening travel was experienced at the same time that midday travel was reduced compared to last year's experience. These results could be explained in two alternative ways: (1) daylight saving time caused extra travel in the early evening in a period when the energy crisis caused travel in general to be reduced; or (2) the extra early evening travel was merely a shift of the midday travel. This data considered in isolation from other indicators cannot distinguish between the two explanations. However, the additional indicators described below do turn the balance of evidence in favor of the explanation that it was daylight saving time and not a shift in traffic from midday to evening that best explains the observed travel patterns.

2. There were pertinent indicators of sudden changes in gasoline use related activity for the spring DST transition at the end of April in recent years:

   - National weekly gasoline sales were up for 4 out of 6 years.

- Average daily distribution of travel showed increases in travel in the evening in 1972.
- Weekly sales in eating places increased for each of 6 years.
- National weekly and monthly gasoline sales averaged for 1967 to 1972 show increases from the sales averaged 1962 - 1966.
- Equivalent day accident analysis for nineteen state-years showing increases instead of the expected decreases for accidents in the late afternoon and early evening.

DST is a better "explanation" for the April transition surge in the indicators than the onset of warm weather because both DST and the observed surges in the data have a sudden onset while the change in the weather is gradual.

To summarize, the pattern of indicators described above does not conclusively show there was an increase in travel resulting from daylight saving time but does indicate that there probably is some increase. The key weaknesses in this inference are that the indications reflect changes in behavior due to DST just after the transitions which may not be persistent.

6.3 HOME HEATING FUEL

6.3.1 Summary and Conclusions

The general conclusion reached is that YRDST may have a significant effect on fuel oil consumption but that any increase or decrease in the amount of fuel oil consumed cannot be substantiated using available data.

This section examines several modes of heating system operation for which possible savings or losses occur. The result is that YRDST was found to have no direct effect on fuel consumption unless the heating system is switched off completely in each 24-hour period. Theoretically, in four of the seven modes of operation examined, losses or gains in oil consumption could occur. However,

sufficient information identifying people's habits in operating their heating system or complementary demographic, climatological, and sociological data required to estimate savings or losses in three of these four cases are currently not available. Obtaining this type information would require the distribution of a detailed questionnaire to households chosen by statistical sampling, asking specific questions concerning the operation of heating systems. In one of the four cases where there may be a change in fuel use, climatological and demographic factors predominate and systematic effect may be anticipated. For this case a low reliability inferential estimate indicates a possible overall energy saving equivalent to one million barrels (equivalent to 10,000 barrels per day) in the winter, chiefly in the South and Southwest. Since the predominant heating fuel is natural gas in those geographical regions and fuel oil is estimated to account for only about 20% of the heating fuel in this area, the saving in fuel oil would be at the most 2000 barrels per day in the winter and would not affect actual oil consumption significantly.

6.3.2 Modes of Heating System Operation

Seven modes of heating system operation are listed below along with a summary of the direct effects each mode would have on fuel consumption in relationship to YRDST. The reader is invited to consult the YRDST Supporting Studies (Vol. II) for a more detailed explanation and discussion of each mode of operation.

a. The inside temperature is maintained at a constant level. If a house is maintained at a uniform temperature, time variations (YRDST) clearly have no effects on fuel consumption.

b. The nighttime temperature is maintained below the daytime temperature. YRDST produces no change in fuel requirements since additional fuel requirements are shifted from the evening to the morning.

c. The daytime temperature is maintained below the nighttime temperature. Again there is no effect since the

additional fuel requirements are shifted from the morning to evening.

d. Heating system is in operation during the daytime only. There is a change in fuel requirements depending upon the difference in morning-evening temperature.

e. Heating system is in operation during the nighttime only. There is a change in overall fuel consumption depending upon morning-evening temperature difference. This is the mode for which we infer a systematic saving of fuel in the winter for the South and Southwestern regions of the country.

f. Heating system is in operation during early morning hours only. There is a change in overall fuel consumption depending upon the morning temperature gradient.

g. Heating system is used during early evening hours only. There is a change in overall consumption depending upon the evening temperature gradient.

6.3.3 Discussion

The analysis above indicates that consumption is affected only when the heating system is turned off completely at some time during a 24-hour period. The overall loss or saving in fuel consumed during YRDST in modes d thru g is a function of the difference in degree-hours. It is estimated that the actual fuel consumption variation caused by lowering or raising the heating system thermostat one degree per hour is .01 gallons of fuel. (See Appendix A of Vol. II, Section 3C for supportive analysis). However sufficient information detailing the actual number of individuals who turn their heating system off during some portion of the day in the winter is not presently available, thus a quantified estimate can not be made at this time.

6.3.4 Indirect Effects of YRDST on Fuel Consumption

Since examination of direct effects produced no conclusive evidence of fuel consumption variations caused by YRDST, the following three indirect or unpredictable systematic effects on fuel consumption were examined.

1. Those arising from technical aspects of heat transfer;
2. Those arising from sociological factors;
3. Those arising from climatic factors in combination with demographic factors.

6.3.5 Technical Factors

Technical factors are not easily quantifiable and are probably insignificant over the temperatures of interest in this analysis. These factors are in part due to non-linear heat transfer by convection and radiation and heating air exchange via infiltration and crackage. These effects are ignored here. Chill factors arising from variance in average wind velocities were analyzed and found not to be a factor. (See Appendix C of Vol. II, Section C.3.)

6.3.6 Sociological Factors

Sociological Factors are highly speculative and sufficient statistics for their consideration are not currently available. Such details as the age of the householders and economic status of the family may very well have a bearing on the heating system operation. To fully evaluate the four modes of operation which offer potential savings or losses, a survey must be initiated which would categorize households according to related socio-economic characteristic, and further, identify the behavioral patterns concerning heating systems operation of each sampled household.

6.3.7 Climatological Factors

There are regions where heating is required at nighttime only during certain months of the year, i.e., the southern states and parts of the Southwest, in particular those at elevated altitudes away from the Pacific Ocean.

The South and Pacific South contain more than a third of the population of the United States and the temperature variations between morning and evening during the winter months are quite severe (approximately 10 degrees for Atlanta and approximately 6 degrees for Los Angles).

If, then, we assume that 1/4 of those living in the South and in the other areas mentioned use heat at night only, we arrive at a savings of 1.0 million barrels. This estimate is based on an assumed savings of 1000 BTUs per degree-hour for an average house.

At present we do not have sufficient detailed information to consider such an estimate to be highly reliable. We conjecture that the overall effect of YRDST on home heating fuel requirements is likely to be reduced fuel consumption in the South and Southwest. The savings are estimated to be on the order of 10,000 equivalent barrels a day during the winter months, of which only 2000 barrels daily is oil and the remainder is natural gas.

6.4 MOTOR-VEHICLE FATALITIES AND ACCIDENTS

No significant effects on traffic safety can be attributed to YRDST. Data for January-March 1974 show a decrease of 23.8 percent in motor vehicle fatalities, as compared to the corresponding months of 1973, but this decline is largely attributable to the lowering of speed limits and the reduced travel resulting from restrictions on the availability of gasoline. Motor vehicle accident data (non-fatalities) for the period of YRDST in 1974 were not available for analysis. Theoretical analyses of previous year accident data were inconclusive.

It is generally accepted that light has a significant effect on motor vehicle accidents. The National Safety Council reports a death rate (deaths per 100 million vehicle-miles) of 3.1 for daylight accidents in 1972, and a death rate of 8.3 for 1972 night accidents. This difference is probably at least partially due to the difference in lighting. A study of 1973 motor-vehicle fatalities for the entire country suggests that there may be relatively high fatalities in the nautical twilight period, thirty to sixty minutes

before sunrise and thirty to sixty minutes after sunset. Another study using data from three large states for 1971 and 1972 indicates a relatively high accident rate in evening nautical twilight.

Assuming no change in travel pattern, one might expect that the change in the light pattern due to YRDST would cause some increase in morning accidents due to the extra hour of darkness in the morning and the shift of the twilight period to a higher traffic hour (i.e., towards rush hour). Similarly, a decrease might be expected in the evening accident rate due to the extra hour of light in the evening and the shift of the twilight period to a lower traffic hour (i.e., away from rush hour). Since there are more accidents in the evening period than in the morning period, a net decrease in total accidents might be expected. However, this does not take into account any change in daily traffic patterns.

Using the Equivalent Day Methodology (as discussed in Volume II, Section 6), a study was made to estimate the change in motor-vehicle accidents due to YRDST including any changes in travel pattern. Injury-causing accident data from 19 states for 1971 or 1972 were used. The Equivalent Day method allows data from such non-YRDST years to be used to estimate the effect of YRDST. It also includes a mechanism for attempting to eliminate the effects of non-YRDST factors. The study found an increase in both morning and evening accidents under YRDST. The estimated net increase in the yearly accident totals was about one percent. The indicated evening increase in accidents may be due to two changes in the travel patterns: first, a shift of travel to the evening due to the one-hour shift of light under YRDST, and second, an additional amount of travel (e.g., recreational) generated by the extra hour of light in the evening. There is some other evidence of a change in travel patterns, as discussed in Section 6A2.

A study of the Daylight Saving Time transitions for nineteen states using data from 1971 or 1972 shows no obvious change in weekly accident totals at the Fall transition but an increase of about 8% in weekly accident totals at the Spring transition. This is another indication of some increase in accidents due to DST, but

other factors (e.g., change to Spring weather) may have been important causes of the observed change. A study of the 1973 transitions using fatality data did not find any pattern of change under YRDST.

In summary, there is an effect of light on motor-vehicle accidents, but evidence seems to show that any change in the yearly motor-vehicle accident total due to a shift of the light pattern under YRDST is small, within about ±1%. The indications point to a small net increase in total accidents, but this may be due to an increase and/or shift in travel rather than a change in the accident rate.

6.5 SCHOOL CHILDREN SAFETY

6.5.1 Conclusions

Fatalities involving school age children over the entire day in both January and February 1973 are reduced from the previous year. There was an increase in school children fatalities during the early morning hours of 6 to 9 a.m. for February 1974 vs. February 1973 but an offsetting decrease in fatalities occurred in the early evening hours. The unusual winter travel conditions as a consequence of the energy crisis make interpretation of net YRDST effects difficult.

6.5.2 Behavioral Hypothesis

DST during the winter months offers potential risks of increases in the number of vehicle/pedestrian and vehicle/pedalcycle accidents involving children of school age, 5 thru 18. The shift in sunrise by one hour results in school children walking, biking, or waiting for school buses during the early morning darkness. Since school schedules many times coincide with office working hours, there is a potential safety hazard as drivers will have a more difficult time recognizing children on road sides because of darkness.

Correspondingly, there is also potential for a reduction in school children fatalities during the early evening hours. The

extra hour of daylight allows children attending schools operating on double sessions or children playing to reach their homes prior to darkness and thus be less subject to accidents related to poorer night visibility.

6.5.3 Findings

6.5.3.1 January 1974 vs. 1973 - The National Safety Council surveyed 42 states and the District of Columbia to determine if there was an increase in the number of school children fatalities for 1974 as compared to 1973. According to the Council, 20 traffic fatalities were recorded in January 1974, among children aged 4 thru 18 walking or pedaling to school during the hours of 6:00 a.m. to 9:00 a.m. By comparison 19 fatalities were recorded for January 1973.

Thirteen of the 20 youthful traffic fatalities in January 1974, were children under 14 years of age. By comparison, 11 of the 19 fatalities recorded for January 1973, were under 14 years of age.

Over a 24-hour period, school-age traffic deaths throughout the United States were down from 76 fatalities in January 1973, to 55 fatalities in January 1974.

6.5.3.2 February 1974 vs. 1973 - A similar study for February also showed a decrease in 24-hour fatalities for 1974 vs. 1973 of 26 (from 157 to 131). However during the hours of 6 a.m. to 9 a.m., there was a substantial increase of 17 fatalities (from 14 to 31). There was also a decrease of 18 fatalities during the early evening hours affected by YRDST, 5 - 8 p.m. If we attribute the change in fatalities during the two periods of shifting sunrise and sunset times to YRDST, we must conclude that there was no net change in the total number of fatalities due to YRDST. However, the total number of fatalities during unaffected hours decreased by 29. See Table 6-1 for actual data. Possible reasons for this larger decline might include: (1) there was a mandatory reduction of the maximum speed limit to 55 mph and (2) gas conservation resulted in fewer vehicle trips.

TABLE 6-1 TOTAL MOTOR VEHICLE RELATED FATALITIES INVOLVING CHILDREN OF SCHOOL AGE (5 TO 18) - FEBRUARY 1974 VS. 1973

Time of Accident	Number of Fatalities		
	1974	1973	Change
12 - 6 a.m.	9	3	+6
6 - 7 a.m.	5	2	+3
7 - 8 a.m.	18	8	+10
8 - 9 a.m.	8	4	+4
9 - 5 p.m.	43	76	-33
5 - 6 p.m.	5	10	-5
6 - 7 p.m.	8	17	-9
7 - 8 p.m.	11	15	-6
8 - 12 p.m.	20	22	-2
unknown	4	--	+4
6 - 9 a.m.	31	14	+17
5 - 8 p.m.	24	42	-18
other hrs	72	101	-29

But it must be remembered that most vehicle/pedestrian accidents occur on city streets where speed is not affected by the 55 mph speed limit and although there is evidence of increased carpooling as a gasoline conservation method, most conservation is a result of fewer long distance trips and not home to work travel. Also there was an increase of 6 fatalities during the non-affected hours of 12 p.m. to 6 a.m. This change for the month of Feburary is difficult to explain because these hours are dark through the major portion of a calendar year.

Another consideration worthy of mention is that reports from 37 states and the District of Columbia indicate school districts in 18 states advancing school schedules by up to an hour because of the safety factor for school children during early morning darkness. About 44% of the school districts and 47% of the students enrolled in the 37 reporting states were affected by the schedule changes.

The advancing of school hours is thought to be a mitigating factor in the morning safety risk to school children associated with YRDST. The following section addresses in more detail effects of YRDST on school hours.

6.6 CHANGES IN SCHOOL HOURS

6.6.1 Conclusions

Reports from 37 States and the District of Columbia indicate school districts in 1u states advanced their school hours because of the problems of dark mornings. About 44 percent of the school districts and 47 percent of the students enrolled in the 37 reporting states were affected by the schedule change.

6.6.2 Introduction

Information concerning the impact of daylight saving time upon the schools of the fifty states was collected and correlated with information already available in the Education Directory 1973-74, Public School Systems with the following results:

1. Thirty-seven state departments of education and the District of Columbia responded.
2. Fourteen of those responses provided opinion but no data.
3. Eighteen responses provided information concerning the number of school districts which were affected by changes in schedules which were made because of daylight saving time.

6.6.3 Findings

Thirty-one responses indicated that safety for school children during early morning darkness was a factor in changes being made in school schedules.

For eighteen states reporting data on the impact of school schedule changes, it was found that 5,695,420 students of the 12, 182,138 enrolled in the schools in the 37 state sample were

affected by such schedule changes. This represents 46.75 percent of the students from the responding states and the District.

Eighteen states providing information on the number of school districts affected by changes in school schedules (see Table 6-2) reported 1,712 of a total of 3805 school districts to have been affected by schedule changes. This represents 43.91 percent of the sample. For these states the average school starting time was advanced by one-half to one hour.

6.6.4 Reaction of Parents and School Officials

Of the eighteen states changing school hours, nine provided information on the reaction of parents to the schedule changes (see Table 6-3). Seven states cited a generally favorable reaction by parents, two reported a mixed response--some parents felt it eliminated the problem of children going to school in dark but working mothers were opposed.

For the same thirty-seven states, twenty-eight provided information on the reaction of school officials regarding the impact of the daylight saving time on the schools. Seventeen reported that winter DST had resulted in negligible fuel saving and eleven of these officials favored repeal of the Act. Six indicated that there had been no change in accidents involving school children. The overall reaction of school officials in this sample to YRDST is mixed.

TABLE 6-2 NUMBER OF STUDENTS AND SCHOOL DISTRICTS AFFECTED BY SCHOOL SCHEDULE CHANGES (BY STATE)

		Students Affected	Students Enrolled	School Districts Affected	Total School Districts
	TOTALS	5,695,420	12,182,138	1,712	3,805
10	*Alabama	32,000	756,048	5	126
11	Alaska	0	83,551	0	32
12	Arizona				
13	Arkansas*				
14	*California			500	1,045
15	*Colorado	280,000	568,229	91	181
16	*Connecticut NSD				
17	*Delaware	131,485	132,251	25	26
18	District of Columbia	0	138,510	0	1
19	*Florida	1,412,281	1,484,909	55	67
20	*Georgia	60,000	1,070,653	8	188
21	Hawaii				
22	*Idaho	75,000	183,729	34	115
23	*Illinois NSD				
24	Indiana				
25	Iowa				
26	Kansas				
27	Kentucky				
28	Louisiana	667,000	819,219	60	66
29	*Maine			115	230
30	*Maryland	514,200	914,202	14	24
31	*Massachusetts NSD				
32	Michigan				
33	*Minnesota NSD				
34	*Mississippi	25,866	517,321	8	150
35	*Missouri NSD				
36	*Montana	159,016	176,685		
37	*Nebraska NSD				
38	*Nevada NSD				
39	New Hampshire				
40	New Jersey				
41	*New Mexico	250,000	276,155		
42	*New York NSD				
43	North Carolina			113	150
44	North Dakota NSD				
45	Ohio				
46	Oklahoma				
47	*Oregon NSD				
48	*Pennsylvania	1,218,000	2,305,601	296	504
49	*Rhode Island	31,000	187,839	11	40
50	*South Carolina NSD				
51	South Dakota				
52	*Tennessee	300,000	880,033	94	146
53	*Texas NSD				
54	*Utah	0	304,495	0	40
55	*Vermont	80,000	106,081	184	245
56	Virginia NSD				
57	*Washington	198,778	783,968	69	314
58	*West Virginia	260,794	407,613	30	55
59	Wisconsin NSD				
60	*Wyoming	0	84,983	0	60
61	U. S. Service Schools				
62	Canal Zone				
63	Guam				
64	Puerto Rico				
66	Virgin Islands				

* Respondents which indicated early morning safety to be a factor in making schedule changes

STAT. CAL. WORK SHEET OE-6004 (8-62) NSD No Statistical Data Provided

TABLE 6-3 STATES CHANGING SCHOOL HOURS DUE TO YRDST

STATE	# of S.D.	Total Enrollment (In Thousands)	# S.D. Changing Starting Time #	%	Degree of Change in Starting Time	# Of Pupils Affected by the Change (in Thousands) #	%	Reason for Changing Starting Time	Reaction of Parents to Changing School Hours	Reaction of School Officials to DST Impact on School
Alabama	126	756	5	6		32		"		
California	1,045		500	50				"		
Colorado	181	560	90	50		280	50		Generally favorable	No serious accidents or other problems can be directly related to DST
Deleware	26	133	25 Most changed	96	1/2 hour later (changed back 3/2/74)	131	98	"	Generally favorable	
Florida	67	1,485	55	82		1,412	95	"		
Georgia	188	1,071	8	4		60		"		Change law/repeal to avoid winter month problems of dark mornings
Idaho	115	183	34		1/2 to 1 hour			Safety of children on dark mornings		
Lousiana	66	819	59	90	1/2 hour later	667		"	Minimal, 50 gen.	Opposed - favor DST April 1 - Oct 1
Maine	125		62	50%				"		
Maryland	24	911	14	58%	1/2 hour later	514	56	"		If YRDST continued will encourage S.D. to start 1/2 hr. later for winter months
New Mexico	88	76	Practically all changed 90%			250		"		No energy saving & DST has caused many problems repeal
Minnesota	438		Quite a few- changed back March 1					Safety of children on dark nornings		More districts will consider switching next winter if YRDST Continues
Mississippi	150	517	7-15	5-10		26	5-10	"		Opposed
Montana	650	176	Large Majority (90%)		1 hour/changed back in March	159	90	"		Opposed

TABLE 6-3 STATES CHANGING SCHOOL HOURS DUE TO YRDST (Cont.)

STATE	# of S.D.	Total Enrollment (In Thousands)	# S.D. Changing Starting Time #	# S.D. Changing Starting Time %	Degree of Change in Starting Time	# Of Pupils Affected by the Change (In Thousands) #	# Of Pupils Affected by the Change (In Thousands) %	Reason for Changing Starting Time	Reaction of Parents to Changing School Hours	Reaction of School Officials to DST Impact on School
North Carolina	151		113	75						Energy savings negligible Oct/ April DST preferred
Oregon			Many changed exceeds 33%		1 hour later			"		Energy savings negligible
Pennsylvania	505	2,305	296	58%		1,218		Safety of children on dark mornings	Generally favorable	Majority of school districts want act repealed - no fuel saved
South Carolina	93		Some changed Some did not (50%)							Mixed
Tennessee	146	880	94		15-45 min.	300		Safety of children on dark mornings	Mixed 66 - favor 50 - Oppose	
Texas	1120	113	Most changed exceeds 50%		1/2 hour later			"	Mixed - working mothers against/ parents for it because of problem of dark mornings	
Vermont	277	106	208	75	1/2 to 1 hour Jan. & Feb.	80	75	Safety of children on dark mornings	Generally favorable	No energy saving in schools
Washington	313	788	69	22	1/2 to 1 hour later/most changed back four to six weeks later	199	25	"		
West Virginia	55	470	30	54	1/2 to 1 hour later	261		Safety of children on dark mornings	Mixed	Mixed - do not attribute accidents to DST - most children traveled to school in dark before DST
Wisconsin	434		Many changed		1 hour later				Working mothers don't approve	Data does not support premise that DST causes accidents. If energy savings not shown - repeal

6.7 CRIME

Given the association of certain kinds of crime with the nighttime, it is not unreasonable to hypothesize that shifting one hour of daylight from morning to evening would result in a reduction of crime. It appears, however, that there is no measurable effect either quantitatively or qualitatively. This generalization is supported by the unanimous opinion of a sample of law enforcement agencies, and is consistent with such statistical data as is available.

Available data bearing directly on the question are limited and inconclusive. In view of this, officials in the F.B.I. and fifteen selected state and municipal law enforcement agencies were asked for opinion and comment. All were of the opinion that year round daylight saving time would have no discernable effect on crime rates. The report of the Department of Justice is reproduced in full in the Appendix.

It remains conceivable that some small effect exists. Given the large total dollar losses and other types of injury caused by crime, even a small effect in reducing this total would be worth identifying. Bearing in mind the fact that the causes of crime are many, varied, and sometimes subtle, a large-scale study would no doubt be required to investigate this question further. However, the unanimity of police officials in the opinion that daylight saving time is not significant with respect to crime rates suggests that such research funds would be better spent elsewhere.

6.8 UTILIZATION OF PARKS AND RECREATION AREAS

It is impossible to quantify changes in the level of utilization of parks and recreation areas, because the state and local authorities who maintain and operate them have no need for detailed information about utilization levels. The National Park Service does measure attendence at many of its facilities, and recorded increased use for January and February of 1974 compared to the same period in 1973. However, they attributed this slight increase to the milder winter in 1974, not to the effect of YRDST.

6.9 LABOR

The Department of Labor indicated that preliminary results of their study were that there were no signigicant effects.

6.10 AGRICULTURE

Year-round daylight saving time does not affect agricultural activities or productivity. The possibility of an effect was explored, and found to be absent, in several agricultural sectors: dairy products, fresh fruits and vegetables, cereal grains, and livestock and poultry. The full study of the Department of Agriculture is reproduced in the Appendix.

In general, associated activities are insensitive to "clock time" and farmers and ranchers, as well as most other elements of agriculture, are therefore not vitally concerned about what type of time system is used. Farmers' activities are determined by seasonal factors and are principally geared to the hours of sunlight, and these patterns pertain, irrespective of clock setting. Even in the case of dairying, where the hour of milling is sometimes changed to accommodate distributors and the public, no effect is discerned on the quality or quantity of milk produced and marketed.

6.11 DOMESTIC COMMERCE

The Department of Commerce indicated no overwhelming approval or disapproval of YRDST on the part of business and industry. Commercial activity seems not to have been significantly affected, with one important exception: the construction industry. The Associated General Contractors of America adopted, at its national convention, a resolution urging the repeat of YRDST, arguing that it:

1. Creates unsafe working conditions
2. Increases energy use on construction projects
3. Increases construction costs through reduced job continuity which reduces productivity

4. Adds another problem to labor relations, namely negotiating flexible starting times among crafts.

6.12 FOREIGN TRADE

The effect of YRDST on foreign trade is generally to shift the extent to which business hours in American time zones overlap those of countries with which we trade. Daylight saving time increases this overlap with Europe and countries to the east by one hour, and decreases the overlap with Japan and other countries to the west by one hour. The Department of Commerce found no evidence of negative impacts in international commercial relations attributable to this overlap effect or to any other effect of YRDST.

7. DESCRIPTION OF ALTERNATIVES

Two characteristics of the results of this study deserve reiteration at this point: (1) the results are of low technical reliability because of the nature of the data, and (2) some of the impact areas seem to have been affected positively, others negatively, and others not at all by YRDST. Because of these characteristics, it is impossible to isolate any given time management system as clearly superior, or more in the national interest, than others. Any system selected will offer advantages to some groups and disadvantages to others and will probably have mixed effects in energy consumption and social and economic areas.

DOT has defined four alternative time management systems for consideration, ranging from Year-Round Daylight Saving Time to Year-Round Standard Time. The proposed alternatives are depicted in Figures 7-1 and 7-2 and are:

1. Have YRDST next winter. This is a provision of the 1973 Act, in which YRDST was adopted as a two-year experiment.
2. Return to the 1967-1973 system. A return to the provisions of the Uniform Time Act of 1966, this entails the observance of DST for approximately six months each year, between the last Sunday in April and the last Sunday in October.
3. Extend the "1967-1973 system" two months into the Spring. DST would, under this system, extend from March through October.
4. Stop Daylight Saving Time. Standard Time would be observed all year.

Table 7-1 lists a number of pro's and con's for each of these four alternatives. Some of these pro's and con's are apparent, independent of technical analysis, or are based on technical work (like the public opinion surveys) which have

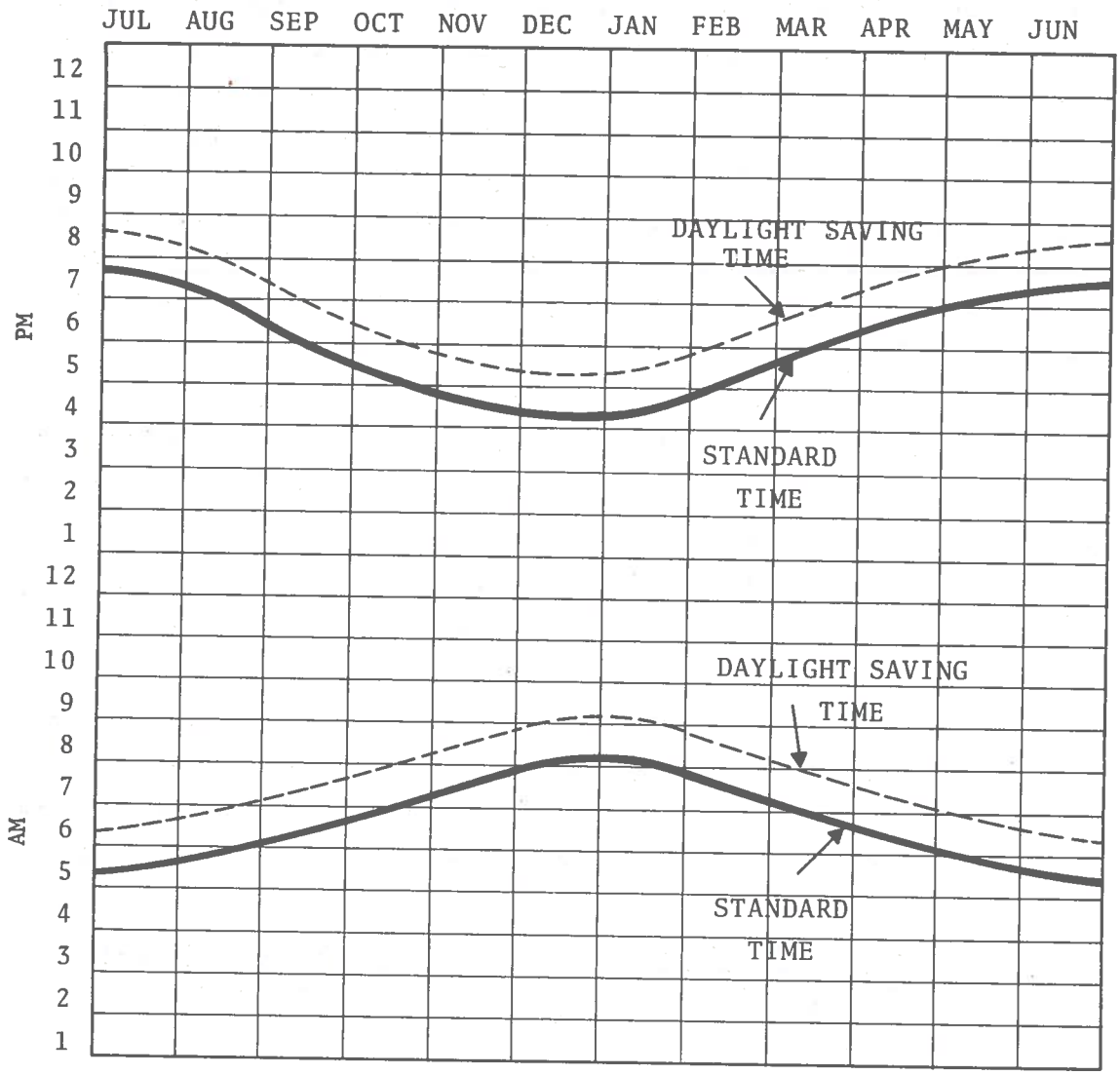

Figure 7-1 Sunrise and Sunset Times, Washington, DC
Standard and Daylight Saving Time

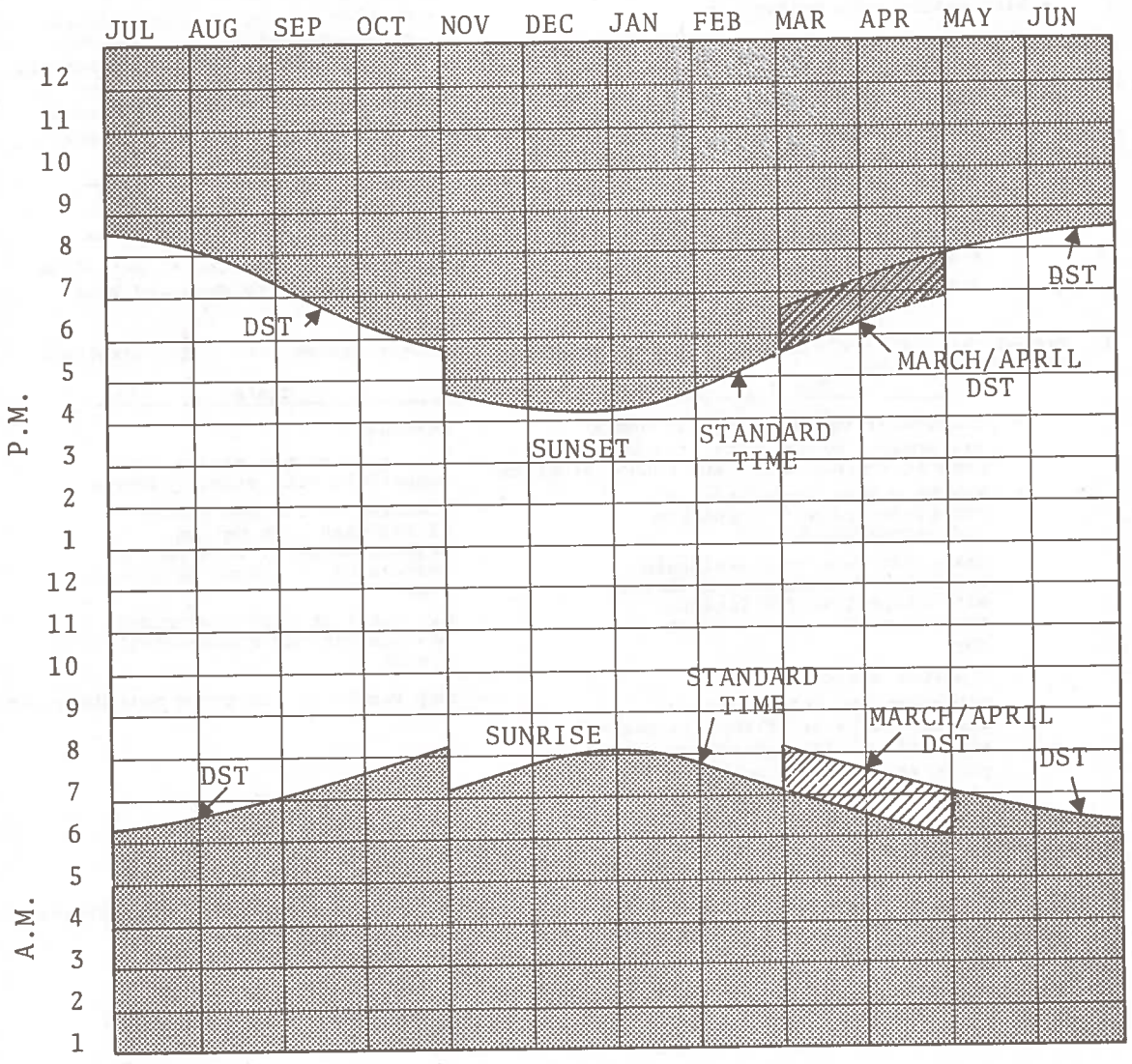

Figure 7-2 Sunrise and Sunset Times, Washington, DC
1967-1973 System, Plus March/April DST

TABLE 7-1 DST ALTERNATIVES

2. Return to the 1967-1973 System (Daylight Saving Time - Approximately May thru October)

Pro's*	Con's*
- Eliminates cost and inconvenience of changing clocks and transportation and communication scheduling	- Public disapproval in February 1974 is expressed in public opinion poll and adverse publicity regarding school children safety
- Some electricity savings	- February school children fatalities were significantly up in morning but down over entire day.
- Better comparisons could be made with data on an additional winter of DST (1974 was abnormal)	- Results in interference between clear channel and daytime only radio stations in morning and disruptions in markets for both
- Plan better data collection	- Disapproval of YRDST by outdoor contractors
- Preliminary studies showing adverse impacts for YRDST are incomplete/inconclusive	
- Additional recreation and social activity	

Pro's	Con's
- Reflects the historical pattern	- Not symmetrical about either shortest day or latest sunrise
- Public opinion was generally favorable	- May result in additional petroleum usage compared to Standard Time
- Return to an accepted system	

3. Extend the "1967-1973 System" to April and March (Daylight Saving Time - Approximately March thru October)

Pro's	Con's
- Eliminates the most objectionable features of winter DST: the late darkness in the mornings; and school problems	- Untried
- May be a more acceptable compromise between opponents and proponents of DST	- U.S. time system may be less compatible with other countries
- Makes DST seem less arbitrary because DST would be symmetrical with respect to the latest sunrise rather than coldest day	- 8 months of DST and 4 months of Standard time may be objectionable to some people because of briefness of standard time
- Previous acceptance of September and October for DST and favorable experience in March and April of 1974 public opinion polls <u>may</u> indicate public acceptance of March and April for DST	- May conflict with historical reasons for the conventional system
	- May result in increased petroleum use
- Additional social and recreational activity	

4. Stop Daylight Saving Time (i.e., have Standard Time all year)

- Eliminates cost and inconvenience of changing clocks/transportation and communication scheduling	- Public largely approves of historical Daylight Saving Time, but with a significant minority in opposition
- May result in reduction in use of petroleum	- Reduced recreational and social activity

*Pro's and Con's that include technical factors are stated "as if" the factors are known with high reliability. But the low technical reliability of these results should be a factor in deciding among these alternatives.

moderate to high reliability. Others, specifically those relating to energy consumption, are based on analysis that is - as previously stated - of low technical reliability. Although the Table presents these technical factors as if they were known, their low reliability should be remembered in evaluating the relative merits of the alternative systems.

The second and third alternatives call for a mixed time system, with DST observed part of the year and Standard Time observed the remainder. These mixed systems introduce the questions of "how much" daylight saving time and "when". The answers to such questions depend on the relative weights given to the pro's and con's of each alternative time system.

Listed among pro's and con's for these alternatives are some considerations of symmetry, a concept which may require elaboration at this point. A mixed time system can be said to be symmetrical if the transition dates are selected so that an equal number of days fall before and after a key day chosen for some superlative quality. For example, the Uniform Time Act of 1966 provides for DST from the end of April until the end of October, which is roughly symmetrical around the warmest day of the year in the end of July. Similarly, the transitions for the eight months of DST described as the third alternative are symmetrical around the latest sunset in summer, (or latest sunrise in the winter). The advantages of symmetrical time systems is that they maximize the enjoyment of a particular known benefit (such as warmth of daylight) or minimize a detriment (such as morning darkness). The two mixed systems of six and eight months of DST (alternatives 2 and 3) both minimize the unpopular experience of dark mornings during the winter months. The six month system puts a premium on having daylight in the evening for the warmest part of the year, while the eight month system (DST from March through October) provides for fullest enjoyment of late-afternoon/early-evening daylight.

One additional alternative, double daylight saving time, was considered and dismissed. Double daylight saving time is a concept in which time is advanced two hours compared to standard time making sunrise and sunset two hours later than standard time. The chief advantage of double standard time occurs in the summer months when daylight could be utilized in the evening rather than the early morning. It's chief disadvantage would be in the winter months when sunrise would be as late as 9:30 a.m. in many parts of the country. Other disadvantages of double daylight saving time are lack of public awareness and acceptance of the concept and the potential increase in the use of gasoline that may be associated with it.

Double daylight saving time should be considered as an alternative system for the summer months.

APPENDIX TO VOLUME I

THE SECRETARY OF COMMERCE
Washington, D.C. 20230

P-2

ACTION
is assigned to
TPI
CONTROL NO.
07289
SIRS S 10

Honorable Claude S. Brinegar
Secretary of Transporation
Washington, D.C. 20590

Dear Claude:

In response to your letter of February 19, 1974, this Department has undertaken a careful review of the foreign trade and domestic commerce effects of Year-Round Daylight Savings Time (YRDST).

Our review indicates that some energy savings can be expected as a result of YRDST. These savings, in the range of one-fourth to three-fourths percent, represent 90 to 275 thousand barrels of oil per day. These amounts, though small when compared to the Nation's total energy demand, are an important contribution to the Nation's energy conservation efforts.

The attitudes of business and industry do not seem to indicate overwhelming approval or disapproval of YRDST except in one important case. The construction industry, represented by the Associated General Contractors of America (AGC), opposes the measure for several reasons, including the safety hazards of working during early-morning darkness in winter. AGC reports that this danger and complications involving safety procedures as outlined in industry labor contracts have caused unnecessary problems. We have enclosed copies of AGC documents and correspondence further outlining this position. It should be noted that the construction industry is the Nation's largest industry.

We have no evidence that the Nation faces any deleterious effects in international commercial relations due to YRDST.

In summary, the Department of Commerce favors continuation of YRDST because of the significant energy savings it can

be expected to achieve. However, we recommend that your Department give careful consideration to any measures that may be available to lessen the impact of YRDST on particular groups, such as the construction industry, for whom the measure has adverse effects.

Sincerely,

Secretary of Commerce

Enclosures

United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

MAY 1 0 1974

Dear Mr. Secretary:

This is in response to your letter of February 19, 1974, and the provisions contained in the Emergency Daylight Savings Time Energy Conservation Act of 1973.

Each bureau and office of the Department of the Interior was surveyed on energy savings attributable to daylight savings time. All bureaus and offices, except the Bonneville Power Administration and the National Park Service, reported that daylight savings time had no effect on their operations.

The Bonneville Power Administration is the Department of the Interior's supplier of power for the Department's northwest region and is also one of the Department's largest users of energy. Their report reflected that the increase in energy savings as a result of year-round daylight savings time was very minimal.

As the protector of America's many scenic and spacious areas of natural beauty and cultural heritage, the National Park Service is the Department of the Interior's second largest user of energy. Their study determined that the increase in park visitation during January and February was primarily due to the mild winter rather than daylight savings time.

Accordingly, we have found that the Emergency Daylight Savings Time has had no significant effect on the operations of the Department of the Interior.

Sincerely,

(sgd) Richard R. Hite

Deputy Assistant Secretary of the Interior

Honorable Claude S. Brinegar
Secretary of Transportation
Washington, D. C. 20590

AMO-CBouchard:jj 5/6/74

cc: AM, AMO, AMO-Amato, Sec. Reading File (2), chron

ASCS
UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL STABILIZATION AND CONSERVATION SERVICE • WASHINGTON, D.C. 20250

May 3, 1974

Dr. Peter Halpern
Deputy Assistant Secretary for
Policy, Plans and International Affairs
Department of Transportation
400 7th Street, S. W., Rm. 10228
Washington, D. C. 20530

Dear Dr. Halpern:

We are transmitting a copy of our report on Year-Round Daylight Savings Time as it Applies to Agriculture. Mr. Myron Miller of your Washington office requested that we hand-deliver the original to him which we have done this date.

We are hopeful that this information will be helpful to you.

Sincerely,

Howard Waters

Howard Waters
Director, West Central Region

Enclosure

Year - Round Daylight Savings Time
As it Applies to Agriculture

I. General Effects of Lights

Farmers and ranchers as well as most other elements of agriculture are not vitally concerned about what type of time system is used but are concerned about the amount of daylight they have available in order to complete their work. Farmers usually work from sun up to sun down.

We explored various aspects of agriculture in order to evaluate what effect the year round daylight savings time may have on agriculture.

A. Dairy - Would the dairy farmer have to get up earlier in order to finish milking in time for an earlier pick up of the milk for market? Would the earlier milking cause any change in the cows ability to produce? The answer to both these questions is no. Most dairies have refrigerated holding tanks and the trucks that pick up the milk are also refrigerated. The time of day the milk is picked up is incidental. We also learned that there is no significant increase or decrease in production of milk because of an earlier milking time.

B. Fresh Fruit and Vegetables Industry - We explored the impact of harvesting fruit and vegetables earlier in the day and learned that the harvesting begins as early in the morning as possible regardless of "clock time." Harvesting is terminated, based on fruit or produce handling and storage conditions as well as the quality of the product. The year round daylight savings time has no effect on these industries.

C. Cereal Grains - (Wheat, Rice, Oats, Barley etc.)

The entire cycle of seedbed preparation planting and harvesting was explored and we find that year round daylight savings time has no effect on this facet of agriculture. Seedbed preparation is carried out at various times of the year and it is not uncommon for plowing, disking and other field activities to be carried out all day and all night when the soil moisture conditions are right or when a planting deadline is near.

Grain harvesting activities usually begin later, by mid morning, when the dew is burned off and continues until as late in the day as possible - The grain elevators remain open to receive grain until after dark, if necessary, during the harvest season.

D. Livestock and Poultry - In visiting with representatives of both industries, we find that the effect of year round daylight savings time on these industries are minimal and no complaints were recorded.

II. Reaction - In conducting our review, several other comments came to our attention that we have recorded but have not tried to evaluate. We recognize that some of these items are not directly related to agriculture. These comments follow:

A. The safety of school children seemed to be on the minds of most people. Many school districts around the county made temporary adjustments in the school starting times which helped the safety problem perhaps, but then the working mothers were thrown into a situation where they would be late to their jobs or other

arrangements had to be made. In addition, many people felt driving to work in the dark is hazardous.

B. Several people commented that they felt they were making a sacrifice to go along with year round daylight savings time. Many of these same people felt that there is no real economic proof that year round daylight savings time will conserve energy.

C. We also heard the view that there does not seem to be any basic evidence that daylight savings time has accomplished anything and that is is a sociological and psychological exercise to lead us to believe we are accomplishing something.

D. One farmer told us that he really likes the year round daylight savings time because his family has to get up and get going earlier and he has a chance to see and visit with them under this system.

III. Summary - We found that everyone has an opinion about year round daylight savings time, some positive and some negative. We have concluded that agricultural production is not effected by what kind of time we use. However, farmers themselves are often inconvenienced because of daylight savings time. An example of this would be where an equipment breakdown occurs in the latter part of the day while there are still a few hours of daylight remaining, the farmer goes to the parts supply house and finds it closed for the day. The business that the farmer must carry out with other segments of the economy will bare out similar examples.

UNITED STATES DEPARTMENT OF JUSTICE
LAW ENFORCEMENT ASSISTANCE ADMINISTRATION
NATIONAL INSTITUTE OF LAW ENFORCEMENT AND CRIMINAL JUSTICE
WASHINGTON, D. C. 20530

June 24, 1974

Dr. Peter Halpern
Deputy Assistant Secretary
for Policy, Plans and
International Affairs
Department of Transportation
400 7th Street, S.W.
Room 10228
Washington, D. C. 20530

Dear Dr. Halpern:

In response to Secretary Brinegar's request to Attorney General Saxbe, dated February 19, 1974, the Department of Justice, through the Emergency Energy Committee of the Law Enforcement Assistance Administration, has conducted an analysis of recent crime data and an informal survey of various law enforcement officials throughout the nation, in an effort to determine the relation, if any, between the institution of permanent Daylight Savings Time and crime trends in the United States. The results of the analysis and survey are contained in the enclosed document entitled "The Impact of Daylight Savings Time on Crime." As you know, a draft of the document was previously submitted to the Department of Transportation.

In general, the report concludes that, from the data examined and the opinions elicited, there is no significant evidence that the institution of year-round Daylight Savings Time has had any important effect on crime rates or trends.

If we may be of further assistance in this matter, please do not hesitate to advise.

Sincerely,

G. M. Alprin

Geoffrey M. Alprin, Chairman
LEAA Emergency Energy Committee

Enclosure

THE IMPACT OF DAYLIGHT SAVING TIME ON CRIME

The Emergency Daylight Saving Time Energy Conservation Act of 1973[1] provides "...that the use of year-round daylight saving time could have other beneficial effects on the public interest, including the reduction of crime...." This report will attempt to evaluate the generally accepted causative factors of crime and through the limited data available, indicate the impact of daylight saving time on certain major types of crime.

Since Crime is a social problem, the factors which cause it are many and vary from place to place throughout the country. Some of the conditions which affect the volume and type of crime that occur are briefly outlined as follows:[2]

Density and size of the community population and the metropolitan area of which it is a part.

Composition of the population with reference particularly to age, sex and race.

Economic status and mores of the population.

Stability of population, including commuters, seasonal, and other transient types.

Climate, including seasonal weather conditions.

Educational, recreational and religious characteristics.

Effective strength of the police force.

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[1]Public Law 93-182, December 15, 1973

[2]Source: Crime in the United States - 1972, FBI, Clarence M. Kelley, Director

Standards of appointment to the local police force.

Policies of the prosecuting officials.

Attitudes and policies of the courts and corrections.

Relationships and attitudes of law enforcement and the community.

Administrative and investigative efficiency of law enforcement, including degree of adherence to crime reporting standards.

Organization and cooperation of adjoining and overlapping police jurisdictions.

Any attempt to evaluate the impact of daylight saving time on crime must recognize the difficulties encountered in discerning precise causal relationships in the myriad of influencing conditions outlined above. Specific analysis is also hampered by the accuracy limitations of reported national crime statistics and the vagaries inherent in the interpretation of such data.

Preceding the January 6, 1974 beginning of winter daylight saving time, reported crime in the U.S. had increased by 5% during 1973 as compared to 1972, with a dramatic overall 16% increase in the last quarter of 1973 over the comparable period a year earlier.[3] Preliminary data for selected cities[4] shows a general continuation of this trend during January 1974 as compared to January 1973 and is shown in Table I.

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[3]Source: FBI Uniform Crime Index Trends released March 29, 1974.
[4]Source: FBI Uniform Crime Reports - Preliminary data subject to later refinement and adjustment.

Table I - Crime Index Trends

(Percent Change)

	October-December 1973 over 1972		January 1974 over January 1973	
City Population	Over I Million	250-500 Thous.	Over I million*	250-500 Thous
Total Crime Index	+7	+11	+5	+3
Violent	-1	+2	---	+4
Property	+10	+12	+7	+4
Murder	+2	-7	-2	-8
Forcible Rape	+13	+17	+11	-2
Robbery	-3	+2	-1	+4
Aggravated Assault	---	+1	---	-4
Burglary	+9	+20	+2	+11
Larceny	+9	+9	+17	---
Auto Theft	+11	+1	-2	-4

*Preliminary data for the same 3 cities over I million population and 19 cities in 250-500 thousand population range.

While these trends are of serious concern to law enforcement at all levels, the actual causative factors are not known. Speculation includes such divergent possibilities as better crime reporting; Watergate; the gasoline shortage; unemployment in the 15 to 24 age group; general discouragement about government; softness of prosecution; and failure of the rehabilitation system.[5] It does seem clear, however, that the influence of daylight saving time must be negligible in its impact, if indeed there is any influence at all.

Comparative crime data provided by the Los Angeles and District of Columbia Police Departments proved to be inconclusive with respect to any impact of daylight ·ing time on their areas of jurisdiction.

Crime trends during the 1967-1972 time period were reviewed with a view to identifying any discernable variations which might have been experienced coincident with the usual April and October daylight saving time transitions. As may be ;een in Table II the trends appear to be somewhat seasonal rather than specifically ·elated to the daylight saving time changes.

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[5]Press Conference of Attorney General William B. Saxbe as reported in the Washington Post, March 30, 1974.

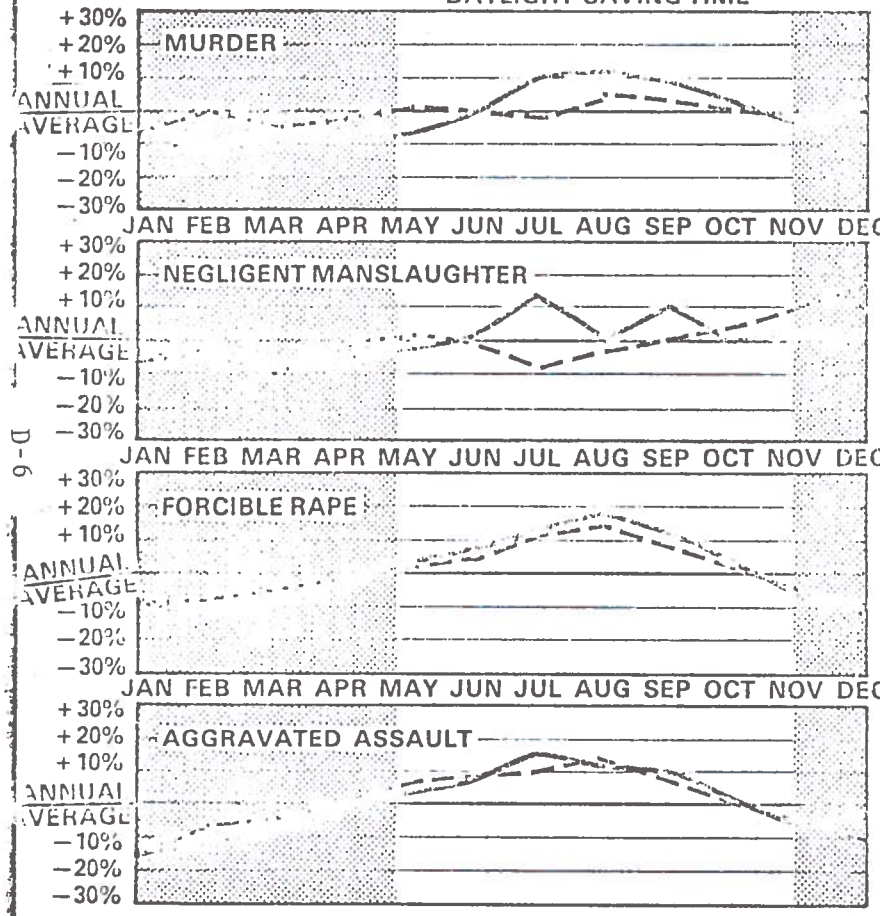
TABLE D-2.

Crimes by Month

1967-1971 MOVING AVERAGE — VARIATION FROM 1972 ANNUAL AVERAGE

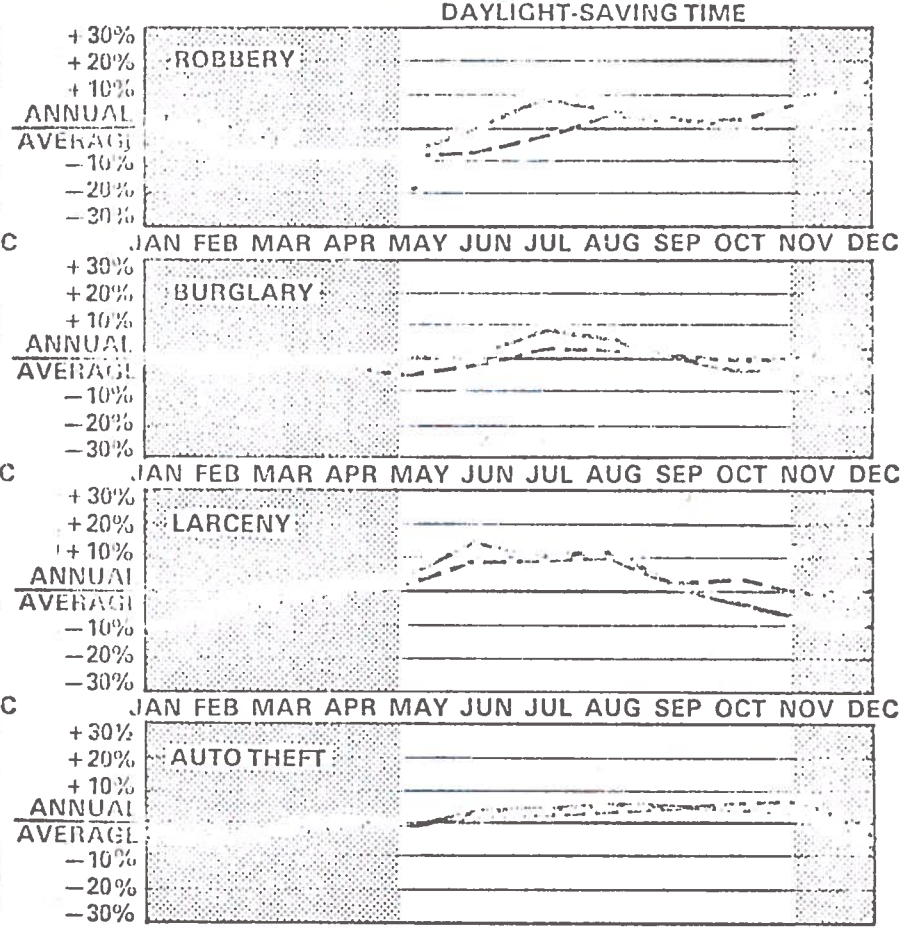
AGAINST THE PERSON

DAYLIGHT-SAVING TIME



AGAINST PROPERTY

DAYLIGHT-SAVING TIME



FBI CHART

TABLE 2

Since the reported crime data for the prior daylight saving time transitions and the January 1974 change-over appears to be inconclusive, responsible officials in the FBI and selected law enforcement agencies[6] across the United States were asked for their opinion and comment. All were of the unanimous opinion that the causative contributing factors of crime are such that year round daylight saving time would have no discernable impact on the reduction of crime. Neither, they felt, would it have any adverse effect on crime rates or trends.

In summary, the analysis of available data and the informed opinion of responsible law enforcement officials indicates that daylight saving time has not had any impact on crime in the United States. The transposition of one hour of daylight from morning to evening is sufficiently inconsequential with respect to the multitude of other contributing factors thought to influence crime as to defy any meaningful cause and effect relationship between daylight saving time and crime.

Agencies contacted: Massachusetts State Police, New York City, New Jersey State Police, District of Columbia, Dade County Sheriff, Atlanta, Chicago, Cuyahoga County Sheriff, Dallas, Polk County Sheriff, Denver, Cheyenne, Los Angeles, Arizona State Police, King County Sheriff.

U. S. DEPARTMENT OF LABOR

OFFICE OF THE SECRETARY

WASHINGTON

JUN 10 1974

Honorable Claude S. Brinegar
Secretary of Transportation
Washington, DC 20590

Dear Mr. Secretary:

This is in further response to your communication of March 25, 1974, concerning the preparation of the interim report required under the Emergency Daylight Saving Time Energy Conservation Act of 1973.

On the basis of the limited information available with respect to work experience under year-round daylight saving time, the Department of Labor has been unable to identify any significant effects on labor caused by the time change.

We have recently been advised that construction unions at a large urban renewal project in the Detroit area have agreed to shift their regular 8 a.m. starting time to 9 a.m., without premium pay for work outside regular hours, in response to the emergency energy crisis and in the interest of safety, so as to avoid starting a work day in darkness. The 8 a.m. starting time in the collective bargaining agreement is to be reinstated when the normal change to daylight saving time would have become effective.

We have no information as to the attitudes and positions taken by other construction unions at other locations on this issue, nor by other (non-construction) unions. You

THE SECRETARY OF COMMEI
Washington, D.C. 20230

P-2

ACTION
CONTROL NO.
07289

realize, of course, that many contracts currently in effect may have a considerable period to run until their expiration date, and modification during their term may be difficult to achieve.

Honorable Claude S. Brinega
Secretary of Transportation
Washington, D.C. 20590

Should additional information become available, we will forward it to you.

Dear Claude:

Sincerely,

In response to your letter of February 19, 1974, this Department has undertaken a careful review of the foreign trade and domestic commerce effects of Year-Round Daylight Savings Time (YRDST).

Peter J. Brennan
Secretary of Labor

Our review indicates that some energy savings can be expected as a result of YRDST. These savings, in the range of one-fourth to three-fourths percent, represent 90 to 275 thousand barrels of oil per day. These amounts, though small when compared to the Nation's total energy demand, are an important contribution to the Nation's energy conservation efforts.

The attitudes of business and industry do not seem to indicate overwhelming approval or disapproval of YRDST except in one important case. The construction industry, represented by the Associated General Contractors of America (AGC), oppos the measure for several reasons, including the safety hazards of working during early-morning darkness in winter. AGC reports that this danger and complications involving safety procedures as outlined in industry labor contracts have caused unnecessary problems. We have enclosed copies of AGC documents and correspondence further outlining this position. It should be noted that the construction industry is the Nation's largest industry.

We have no evidence that the Nation faces any deleterious effects in international commercial relations due to YRDST.

In summary, the Department of Commerce favors continuation of YRDST because of the significant energy savings it can

p. 2

DEPARTMENT OF STATE

Washington, D.C. 20520

ACTION
IS ASSIGNED TO
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CONTROL NO.
05128
SIRS S-10

MAR 15 19

Dear Mr. Secretary:

In your letter of February 19 to Secretary Kissinger you requested the Department's views concerning the impact year-round daylight saving time has had upon our foreign trade. In our judgement it can be expected to have little effect and available data cannot measure that effect.

To the extent the adoption of daylight saving time reduced the demand for energy it would, everything else remaining the same, have reduced the prices of energy. Hence our energy intensive goods would have become less expensive than they otherwise would have been, encouraging exports and import substitution. There is no data available which enables us to test this hypothesis. In any event I would expect the effect, if it exists, to be unmeasurably small. This would be true even if the effect of DST on energy usage were fairly substantial, since energy costs are only a minor proportion of total costs.

We have discussed the impact of daylight saving with dealers in foreign exchange, who tell us that their operations are tied to those of their domestic customers, and reducing the time difference with Europe has consequently had no effect.

Sincerely,

Willis C. Armstrong

Willis C. Armstrong
Assistant Secretary of State

EXECUTIVE SECRETARIAT
DEPARTMENT OF TRANSPORTATION
'71 MAR 20 PM 2:32
U.S. DEPT. OF TRANSPORTATION

The Honorable
Claude S. Brinegar
Secretary of Transportation
Washington, D. C.

FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554

P/1

APR 17 1974

IN REPLY REFER TO:
8840-L

Honorable Claude S. Brinegar
The Secretary of Transportation
Washington, D. C. 20590

Dear Mr. Brinegar:

I have your letter of March 25, 1974, concerning the effect of daylight saving time legislation (PL 93-182) on standard (AM) broadcast stations.

The Commission has adopted a series of interim orders and rule-making proposals in Docket 19902 designed to maximize the pre-sunrise operations of daytime-only stations without causing undue nighttime skywave interference to fulltime services being conducted on the same channels. Copies of documents released to date in this proceeding (FCC 73-1323, FCC 73-1324, and FCC 74-135) are enclosed for your detailed information. It will be noted that section 6 of PL 93-182 only confers emergency powers on the Commission to make appropriate adjustments in the early morning modes of daytime stations. For this reason, the problems created by this legislation as they affect fulltime stations can only be considered in the context of the ongoing rule-making proceeding.

In general terms, and pending outcome of rule making, daytime stations' sign-on times have been "backed up" one full hour during the October-April portion of the year, at a minimum power of 50 watts, except where such operation is barred by international agreement. These added benefits have had to be carefully meshed with pre-sunrise operations conducted by daytime stations under existing rules. The relief dispensed to date has, of necessity, been relatively conservative in view of the irreconcilable conflict of interests between daytimers and fulltimers sharing the same channels. Specifically, under nighttime skywave propagation conditions in the AM broadcast band, added increments of pre-sunrise operation necessarily result in a corresponding compression of the interference-free nighttime service contours of co-channel fulltime stations. The twin objectives laid down by Congress in section 6 (PL 93-182) of (a) maximizing the pre-sunrise services of daytime stations, and (b) guaranteeing the continued interference-free reception of fulltime services, therefore tend to be mutually exclusive. A preliminary examination of comments filed thus far in Docket 19902 only reinforces my belief that whatever long-term solutions emerge from the rule-making proceeding cannot fully satisfy all segments of the AM broadcast industry.

Honorable Claude S. Brinegar

On the assumption that PL 93-182 will run its prescribed course (through April 1975 and perhaps beyond), we have, on the international front, initiated discussions with Canada, Mexico, and the Bahamas in an effort to obtain new or expanded pre-sunrise operating benefits for the more than 500 U.S. daytimers assigned to frequencies on which foreign stations have I-A and I-B nighttime clear channel priorities. In the case of Canada, these discussions are nearing completion, and we are hopeful that as a result, the 200-odd U.S. daytimers assigned to the seven Canadian I-A clear channels will be able to operate one hour before local sunrise in some fashion.

It should be noted that the problem goes beyond daytime stations and the needs of their audiences. For instance, some unlimited time stations are experiencing serious audience losses during the early morning hours. These losses result from the one-hour "clock-time" delay in switching from authorized nighttime facilities to authorized daytime facilities, as well as from the presence of new skywave interference generated by the many co-channel daytimers which have been "backed up" one hour under the terms of the enclosed emergency orders.

These problems will be effectively eliminated by May 1, but will recur with the advent of shorter days in the fall. Hardest hit are those daytimers which, by reason of channel assignment or geographic proximity to foreign stations, are unable to operate at all during the pre-sunrise period, and particularly those stations located in the western portions of time zones where sunrise in December and January sometimes does not occur until 9:00 a.m. (advanced time). Because of the economic importance of the "drive-time" audience, licensees so situated have reported winter revenue losses of up to 20 percent.

To summarize, the early morning operations of many AM broadcast stations have been seriously affected by the enactment of PL 93-182. There has been some corresponding inconvenience to the listening public. These problems are most acute during the months of November, December, January and February. Finally, the electrical characteristics of the AM broadcast band during nighttime (including pre-sunrise) hours place serious limitations on the Commission's ability to resolve these problems to the satisfaction of all concerned. Within these limitations, however, we are doing everything possible to adjust the problems created by this legislation.

Please call on me again if further information is desired.

Sincerely yours,

Richard E. Wiley

Richard E. Wiley
Chairman

Enclosures-3

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

FCC 73-1323

07744

In the Matter of)
)
Amendment of Part 73 of the Commission's)
Rules to provide a one-hour advancement)
in the sign-on times of daytime AM broad-) Docket No. 19902
cast stations to recoup the morning hour)
lost by the enactment of year-around Day-)
light Saving Time.)

NOTICE OF INQUIRY AND PROPOSED RULE MAKING

Adopted: December 18, 1973; Released: December 20, 1973

By the Commission:

1. By Public Law approved December 15, 1973, and effective January 6, 1974 (PL 93-182), Daylight Saving (advanced) time will be observed throughout most of the nation, on a year-around basis, through the last Sunday of April, 1975. This legislation, adopted as an energy conservation measure, amends the Uniform Time Act of 1966, under which most of the country heretofore observed advanced time for only six months each year.

2. The adoption of year-around advanced time will affect the early morning operations of the approximately 2274 daytime stations in the United States, and particularly those 624 daytimers not holding pre-sunrise service authorizations (PSA's). Of this 624, 346 are ineligible for PSA's under current regulations. Another 278 are technically eligible for PSA's but have not applied --in most cases because the pre-sunrise operating benefits available to them under present regulations are highly marginal in terms of permissible sign-on times and power levels. Under the new legislation, and absent remedial action by the Commission, the sign-on times for these 624 stations, and for Class II daytimers generally, would be delayed a full hour in relation to community clock time during the October-April portion of the year. For example, a 7:30 a.m. sign-on in January will become an 8:30 a.m. advanced-time sign-on. Revenue losses from loss of the "drive-time audience may adversely affect the financial viability of an undetermined number of daytime stations.

3. In recognition of this problem, the Congress has, in section 6 of PL 93-182, provided as follows:

> Sec. 6. Notwithstanding any other law or any regulation issued under any such law, the Federal Communications Commission shall, consistent with any existing treaty or other agreement, make such adjustment by general rules, or by interim action pending such general rules, with respect to hours of operation of daytime standard amplitude modulation broadcast stations, as may be consistent

with the public's interest in receiving interference-free service. Such general rules, or interim action, may include variances with respect to operating power and other technical operating characteristics. Subsequent to the adoption of such general rules, they may be varied with respect to particular stations and areas because of the exigencies in each case.

By companion Order released today in this proceeding, we have attempted to provide the interim relief contemplated by this legislation pending the completion of general rule making and the outcome of negotiations with foreign governments concerning stations presently precluded, by foreign clear channel protection requirements, from obtaining the one-hour advancement.

4. The pre-sunrise operating benefits obtainable under present rules are an outgrowth of three major rule making proceedings and companion international agreements reached with Canada and Mexico over the past six years. Report and Order in Docket No. 14419, 8 FCC 2d 698 (1967); First Report and Order in Docket No. 18023, 14 FCC 2d 393 (1968); Report and Order in Docket Nos. 17562, 18023, and 18036 (1969); 1967 agreement with Canada concerning pre-sunrise transmission in the standard broadcast band (TIAS-6268); and 1970 agreement with Mexico concerning pre-sunrise transmission in the standard broadcast band (TIAS-7021). In general terms, the pre-sunrise operating benefits for daytimers which have resulted from these proceedings and agreements are as follows: Of the 1650 daytime stations holding PSA's, most are Class III stations assigned to the 41 regional channels shared with a lesser number of fulltime stations. Their PSA's permit a 6:00 a.m. local time sign-on, with a power of 500 watts (or less when necessary to meet foreign station protection requirements). A substantial (but lesser) number of daytimers holding PSA's are assigned to U.S. and foreign clear channels. Their sign-on times are regulated by sunrise times at the co-channel dominant stations to the east, with power reduced to afford interference protection to the co-channel station(s) to the west. In no event does a PSA permit a sign-on time earlier than 6:00 a.m., local time, or an operating power in excess of 500 watts. Because of the added time and power limitations normally applying to daytimers assigned to clear channels, they are more seriously affected by the new legislation than are the daytimers on regional channels.

5. The problem of greatest urgency is the status of the 346 daytimers currently ineligible for pre-sunrise operating privileges in any form. These include Class II stations assigned to Canadian and Bahamian I-A clear channels; Class II stations assigned to U.S. I-A clear channels and located east of the dominant station; Class II stations located within or near the 0.5 mV/m 50% skywave contours of co-channel U.S. I-B clear channel stations; and Class II stations so located that they cannot meet foreign co-channel protection requirements.

6. The majority of these "ineligibles" (243) are assigned to the seven Canadian and one Bahamian I-A clear channels: 540 kHz, 690 kHz, 740 kHz, 860 kHz, 990 kHz, 1010 kHz, 1540 kHz, and 1580 kHz. For the time being, and pending the outcome of international negotiations being initiated at this time, we are unable to offer any relief to licensees in this particular category. While we are keenly aware of the economic and competitive dislocations involved, these stations will, until further order of the Commission, be required to continue to observe the standard (non-advanced) sign-on times presently specified in their licenses for each month of the year.

7. Most of the remaining 103 "ineligibles" are Class II daytimers assigned to frequencies on which the United States has I-A and I-B clear channel priorities. As to stations on these channels, it is possible to grant relief, where none now exists, without further negotiations with foreign governments. This has been done on an interim, reduced-power basis in the companion Order released today in this proceeding. (These stations are presently ineligible for PSA's either because they are located within or near the 0.5 mV/m 50% skywave contour of a co-channel Class I-B clear channel station, or are located east of a co-channel I-A, the latter being protected by exclusivity of assignment rather than by defined service contours).

8. It is apparent that earlier sign-on times at Class II daytimers on these clear channels will result in skywave interference to the dominant station assignments. This will be true whether the interference is calculated under the "second hour" curves normally used in determining nighttime interference, or under diurnal curves which show less interference impact than conventional nighttime computations. Whether these losses of areas and populations to interference should be regarded as serious depends on how many rural listeners presently rely on the clear channel services available to them and the importance attached to those services. We have no recent information concerning the listening habits of rural residents in this regard. In any event, whatever skywave interference may result from new co-channel Class II operations during the early morning hours will lessen with the approach of sunrise. Moreover, it will be minimized by the power ceilings proposed in paragraph 9, infra.

9. In view of the overriding objectives of PL 93-182, we have tentatively determined that a new class of pre-sunrise service authorization should be created, to be known as "temporary pre-sunrise service authorizations" (TPSA's). A TPSA, if granted, would provide the one-hour advancement in sign-on times comtemplated by Congress. It would be issued to PSA holders and non-PSA holders alike, except that persons eligible for a PSA would be required to obtain one as a condition precedent to obtaining a TPSA. Class III PSA-holders assigned to regional channels, as well as Class II PSA-holders assigned to Mexican I-A clear channels, may already, under section 73.99 of the rules and the terms of their PSA's, commence operation as early as 6:00 a.m. local time. Hence, there would be no need for stations in these two categories to apply for TPSA's. Requests for TPSA's filed by other Class II daytimers would be processed under amendments to the existing PSA rule (section 73.99), as follows:

* * * * *

(j) During the effectiveness of national legislation requiring a one-hour time advancement between the last Sunday of October and the last Sunday of April, licensees and permittees of Class II daytime stations, except those stations assigned to Canadian and Bahamian I-A clear channels or whose sign-on times are regulated by sunrise times at foreign I-B clear channel stations to the east, may request, by letter, a temporary pre-sunrise service authorization (TPSA). If granted, the TPSA shall specify a one-hour advancement in the regularly licensed or PSA sign-on times, as appropriate, and shall be subject to the following requirements and limitations:

(1) The starting time shall be no earlier than 6:00 a.m., local time.

(2) For TPSA-holders ineligible for a PSA, the operating power shall not exceed 50 watts: Provided, That upon a showing that the need for the extended service outweighs the interference to the clear channel stations concerned, operating powers of up to 100 watts may be authorized.

(3) For TPSA-holders holding PSA's, the operating power shall correspond to that authorized in the PSA.

(4) No request for a TPSA shall be granted to a licensee or permittee eligible for, but not holding, a PSA.

(5) TPSA's issued under the provisions of this paragraph shall, up to operating powers of 50 watts, be granted without regard to co-channel skywave interference caused to Class I-A, Class I-B, and Class II fulltime co-channel stations in the United States.

(6) Foreign nighttime interference protection requirements, as defined in international agreements to which the United States is a party, shall be observed.

(7) Any request for a TPSA shall describe the method whereby the power reduction will be achieved, shall identify foreign fulltime stations (if any) on the channel, and shall include calculations to establish that operating as proposed, no objectionable interference to foreign stations will result.

(8) Authorizations issued under this paragraph shall confer no interference protection on the holders thereof, and shall otherwise comply with the provisions of paragraphs (e), (f), (g), (h), and (i) of this section.

10. We invite comments on the specific proposal outlined above, together with the following related matters:

(a) A substantial number of daytime AM licensees and permittees have co-owned, unlimited-time FM broadcast stations assigned to the same or nearby communities. In view of their present ability to render an early morning service in the FM band, should they be eligible for TPSA's on the same footing as daytimers with no FM affiliation?

(b) There are 52 daytime stations holding PSA's whose pre-sunrise powers are limited to less than 50 watts in order to afford 0.5 mV/m 50% skywave protection to U.S. Class I-B clear channel stations.* In addition, there are 105 more daytimers on these channels which are restricted as to hours only; i.e., with permitted sign-on times delayed beyond 6:00 a.m. Finally, there are more than 275 daytimers technically eligible for PSA's but which have never applied. Analysis of the latter group shows that approximately half, if they applied, would be limited to PSA operating powers of less than 10 watts and/or significant restrictions as to time. The question thus presented is whether an effort should be made in this proceeding to place these 432 stations on the same power footing as presently ineligible stations which, presumably, will be applying for TPSA's. The comments of interested parties on this aspect of the problem are requested.

(c) Fulltime stations (including 261 fulltimers presently holding PSA's which provide an optional mode of operation during the pre-sunrise hours) are beyond the scope of the interim relief intended by Congress. We recognize, however, that fulltime stations (along with specified hours stations) will be required to continue pattern-shifting at the non-advanced times specified in their station licenses. Depending on the severity of nighttime pattern restrictions, some of these stations could be disadvantaged during the pre-sunrise hours vis-a-vis daytimers in the same market holding PSA's and/or TPSA's. We also recognize that any effort to advance pattern-shifting times at fulltime and specified hours stations (where such advancement involves licensed modes rather than PSA facilities) might well create hearing rights on behalf

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* Fifty (50) of these stations, because of their geographic relationship with their co-channel dominant stations, are also seriously limited as to sign-on times.

of other fulltimers on the same channels, and would raise serious questions under definitions of daytime and nighttime operation as set forth in the 1950 North American Regional Broadcasting Agreement (NARBA, TIAS-4460) and the 1970 U.S. -Mexican standard broadcasting agreement (TIAS-7021). The comments of interested parties are nonetheless invited.

11. Authority for institution of this proceeding, and for adoption of rules concerning the matters involved, is contained in sections 4(i), 303(r), and 403 of the Communications Act of 1934, as amended.

12. Pursuant to applicable procedures set forth in section 1.415 of the Commission's rules, interested persons may file comments on or before February 20, 1974. and reply comments on or before March 22, 1974. All relevant and timely comments and reply comments will be considered by the Commission before final action is taken in this proceeding.

13. In reaching its decision in this proceeding, the Commission may also take into account other relevant information before it, in addition to the specific comments invited by this Notice.

14. In accordance with the provisions of section 1.419 of the rules, an original and 14 copies of all comments, replies, pleadings, briefs, and other documents shall be furnished the Commission. All filings made in this proceeding will be made available for examination by interested parties during regular business hours in the Commission's Public Reference Room at its headquarters, 1919 M Street, Washington, D.C.

FEDERAL COMMUNICATIONS COMMISSION

Vincent J. Mullins
Secretary

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

FCC 73-1324

07745

In the Matter of	)	
	)	
Emergency implementation of national daylight saving time legislation (PL 93-182) with respect to sign-on practices of daytime-only AM broadcast stations.	)	Docket No. 19902

ORDER

Adopted: December 18, 1973 Released: December 20, 1973

By the Commission:

1. By Public Law approved December 15, 1973, and effective January 6, 1974 (PL 93-182), Daylight Saving (advanced) time will be generally observed in the nation on a year-around basis, through the last Sunday of April, 1975. This legislation, adopted as an energy conservation measure, amends the Uniform Time Act of 1966, under which most of the country heretofore observed advanced time for only six months of the year.

2. To enable affected stations to recoup the resulting one-hour morning time loss between the last Sunday of October and the last Sunday of April, section 5 of PL 93-182 directs the Commission to make appropriate adjustments in the sign-on times and pre-sunrise powers of daytime-only AM broadcast stations to the extent feasible in light of existing treaty commitments and clear channel protection considerations. *

3. By Notice of Inquiry and Proposed Rule Making released today in this proceeding, we have proposed that during the effectiveness of PL 93-182, certain classes of daytime-only stations be permitted to apply for temporary pre-sunrise service authorizations (TPSA's). Except for stations with foreign interference problems, the TPSA would, in general, provide the holder with one hour of added pre-sunrise operation at an operating power of 50 watts, with provision for higher power (up to 100 watts) in certain limited situations.

* Since daytime stations will continue to sign off at the standard (non-advanced) times specified in their station licenses, the one-hour adjustment contemplated by Congress will actually add one hour to the daily operating schedule. Fulltime and specified hours stations are beyond the scope of this Order. Such stations must therefore employ their authorized nighttime facilities to provide whatever extended hours of operation they deem appropriate. The possible adjustment of pattern-switching times for fulltime and specified hours stations will, however, be considered in the companion rulemaking proceeding initiated today.

4. Approximately, 1650 daytime stations hold pre-sunrise service authorizations (PSA's) under section 73.99 of our rules. Most PSA holders are Class III stations on regional channels, and operate with a pre-sunrise power of 500 watts (or less, if necessary to meet foreign co-channel protection requirements). These Class III daytimers holding PSA's may commence operation with their PSA powers at 6:00 a.m. local time, and will therefore automatically achieve a one-hour advancement under PL 93-182 during the October-April portion of the year.

5. A substantial (but lesser) number of daytimers holding PSA's are assigned to U.S. and foreign clear channels. Their sign-on times are regulated by actual sunrise times at co-channel dominant stations to the east, with power reduced to afford interference protection to co-channel dominant stations (if any) to the west. Finally, there are 346 daytimers currently ineligible for pre-sunrise operating privileges in any form. These include Class II stations assigned to U.S. I-A clear channels and located east of the dominant station; Class II stations within or near the 0.5 mV/m 50% skywave contours of co-channel U.S. I-B clear channel stations; Class II stations assigned to Canadian and Bahamian I-A clear channels; and Class II stations so located that they cannot meet foreign co-channel protection requirements.

6. The rule making proceeding initiated today cannot be completed prior to the January 6, 1974, effective date of PL 93-182. In order to afford interim relief to as many of the affected stations as possible we are, on an emergency basis, taking the measures ordered below. Authority for the adoption of this Order is contained in section 6 of PL 93-182 and section 4(i) of the Communications Act of 1934, as amended. Because of the urgent need for the interim adjustments herein ordered and because we interpret the new legislation as permitting these adjustments without regard to hearing rights which might otherwise be asserted by affected fulltime stations under section 316 of the Communications Act, we find that compliance with the notice and effective date provisions of the Administrative Procedure Act (5 U.S.C. 553) is not required.

7. Accordingly, IT IS ORDERED, That effective January 6, 1974, and pending further action of the Commission:

(a) Class III daytimers assigned to regional channels and presently holding PSA's may, in accordance with section 73.99 of the rules, sign on at 6:00 a.m. local (advanced) time with the pre-sunrise facilities described in their PSA's. The PSA mode of operation shall be continued until the standard (non-advanced) sign-on times specified in their station licenses, at which times they shall shift to the daytime facilities specified therein.

(b) Class II (secondary) daytimers assigned to Mexican I-A clear channels and presently holding PSA's may, in accordance with section 73.99 of the rules, sign on at 6:00 a.m. local (advanced) time with the pre-sunrise facilities described in their PSA's. The PSA mode of operation shall be continued until the standard (non-advanced) sign-on times specified in their station licenses, at which times they shall shift to the daytime facilities authorized therein.

(c) Class II (secondary) daytimers assigned to Canadian or Mexican I-B clear channels and presently holding PSA's shall, pending outcome of international negotiations, continue to sign-on at the actual sunrise time at the controlling foreign Class I-B station to the east (if any) with the pre-sunrise facilities described in their PSA's. The sign-on times shall be one hour later than those listed for the October-April portion of the year in Commission letters held by such Class II stations. The PSA mode of operation shall be continued until the standard (non-advanced) sign-on times specified in their station licenses, at which times they shall shift to the daytime facilities authorized therein.

(d) Class II (secondary) daytimers assigned to U.S. I-A and I-B clear channels and presently holding PSA's may achieve the one-hour advancement by adhering, throughout the year, to the sign-on times specified in outstanding Commission letters with the pre-sunrise facilities described in their PSA's. The PSA mode of operation shall be continued until the standard (non-advanced) sign-on times specified in their station licenses, at which times they shall shift to the daytime facilities authorized therein.

(e) Class II (secondary) daytimers assigned to Canadian and Bahamian I-A clear channels (i.e., 540 kHz, 690 kHz, 740 kHz, 860 kHz, 990 kHz, 1010 kHz, 1540 kHz, and 1580 kHz) shall, pending outcome of international negotiations, continue to observe the standard (non-advanced) sign-on times specified in their station licenses.

(f) Class II (secondary) daytimers assigned to U.S. I-A and I-B clear channels and currently ineligible for a PSA because of their geographic relationship or proximity to U.S. co-channel dominant stations may, on the effective date of this Order, commence operation one hour prior to local sunrise with a power of 50 watts into the daytime or critical hours antenna system, as appropriate, and may continue such mode of operation until the standard (non-advanced) sign-on times specified in their station licenses: Provided, That on or before April 15, 1974, stations availing themselves of this privilege shall give written notice to the Commission setting forth the date such operation commenced, describing the method whereby the power reduction has been achieved, and including calculations to establish that the 50 watt pre-sunrise operation causes no objectionable interference to any foreign station; and: Provided further, That in no event shall operation under this paragraph commence earlier than 6:00 a.m. local time; and: Provided further,

That radio stations WOI, Ames, Iowa; WNAD, Norman, Oklahoma; WHLO, Akron, Ohio; WWJC Duluth, Minnesota; and KPPT, Anadarko, Oklahoma, shall, pending outcome of international negotiations, delay their sign-on times until local sunrise at the Canadian and Mexican Class I-B clear channel stations on their frequencies, as identified in the Attachment.

8. IT IS FURTHER ORDERED, That any licensee or permittee eligible for a PSA must apply for and obtain such PSA before the privileges conferred by this Order shall become operative.

9. IT IS FURTHER ORDERED, That to the extent that operations undertaken under this Order may conflict with the Commission's technical rules, such rules, are hereby waived.

10. IT IS FURTHER ORDERED, That any operation undertaken under the terms of this Order may be modified or terminated by the Commission, without prior notice or right to hearing, if necessary to resolve international interference conflicts, to implement agreements with foreign governments, or in other circumstances warranting such action.

11. IT IS FURTHER ORDERED, That the pre-sunrise operating benefits conferred by this Order shall not apply to stations located in states, or portions of states, in which advanced time is not observed during the October-April portion of the year.

12. IT IS FURTHER ORDERED, That this Order, or a photocopy thereof, shall be posted by all licensees and permittees undertaking to operate under the terms thereof, with an indication of the paragraph under which the pre-sunrise operation is being conducted.

FEDERAL COMMUNICATIONS COMMISSION

Vincent J. Mullins
Secretary

Attachment

540	Can.	I-A	CBK	Watrous, Sask.	50kw, ND, U
	Mex.	I-A	XEWA	San Luis Potosi	150kw, ND, U
550	Cuba	I-C	CMJ	Havana 10kw, DA, U or 2.5kw, ND, U	
570	Cuba	I-D	CMHI	Santa Clara	10kw, DA, U
590	Cuba	I-D	CMCI	Havana	25kw, DA, U
620	D.R.	I-C	HIBD	Santo Domingo	10kw, ND, U
630	Cuba	I-D	CMQ	Havana	25kw, DA-1, U
640	U.S.	I-A	KFI	Los Angeles	50kw, ND, U
	Can.	I-B	CBN	St. John's, Nfld.	10kw, ND, U
	Cuba	I-C	CMGQ	Santa Clara	15kw, DA, U
650	U.S.	I-A	WSM	Nashville	50kw, ND, U
660	U.S.	I-A	WNBC	New York City	50kw, ND, U
670	U.S.	I-A	WMAQ	Chicago	50kw, ND, U
680	U.S.	I-B	KNBR	San Francisco	50kw, ND, U
690	Can.	I-A	CBF	Montreal	50kw, ND, U
	Mex.	I-B	XETRA	Tijuana	50kw, DA-2, U
	Cuba	I-C	CMBC	Havana	50kw, DA, U
700	U.S.	I-A	WLW	Cincinnati	50kw, ND, U
710	U.S.	I-B	WOR	New York City	50kw, DA-1, U
	U.S.	I-B	KIRO	Seattle	50kw, DA-N, U
720	U.S.	I-A	WGN	Chicago	50kw, ND, U
730	Mex.	I-A	XEX	Mexico City	500kw, DA, U
				(presently 50kw, ND, U)	
740	Can.	I-A	CBL	Toronto	50kw, ND, U
	Cuba	I-D	CMKJ	Holguin	10kw, DA, U
750	U.S.	I-A	WSB	Atlanta	50kw, ND, U
760	U.S.	I-A	WJR	Detroit	50kw, ND, U
770	U.S.	I-A	WABC	New York City	50kw, ND, U
780	U.S.	I-A	WBBM	Chicago	50kw, ND, U
800	Mex.	I-A	XEJO	Ciudad Juarez	150kw, ND, U
810	U.S.	I-B	KGO	San Francisco	50kw, DA-1, U
	U.S.	I-B	WGY	Schenectady	50kw, ND, U
820	U.S.	I-A	WBAP	Fort Worth	50kw, ND, U
830	U.S.	I-A	WCCO	Minneapolis	50kw, ND, U
840	U.S.	I-A	WHAS	Louisville	50kw, ND, U
850	U.S.	I-B	KOA	Denver	50kw, ND, U
	Mex.	I-B	XETQ	Crizaba, Veracruz10kwD/50kwN, DA-N, U	
				(presently 10kw, DA-2, U)	
860	Can.	I-A	CJBC	Toronto	50kw, ND, U
	Cuba	I-C	CMBL	Havana	25kw, DA, U
870	U.S.	I-A	WWL	New Orleans	50kw, DA-1, U
880	U.S.	I-A	WCBS	New York City	50kw, ND, U
890	U.S.	I-A	WLS	Chicago	50kw, ND, U
900	Mex.	I-A	XEW	Mexico City	250kw, ND, U
920	Cuba	I-D	CMJL	Camaguey	10kw, DA, U
940	Can.	I-B	CBM	Montreal	50kw, ND, U
	Mex.	I-B	XEQ	Mexico City 150kwD/50kwN, ND, U	
				(presently 50kw, ND, U)	
950	Cuba	I-D	CMKF	Havana	10kw, DA, U
980	Cuba	I-D	CMCK	Havana	10kw, DA, U
990	Can.	I-A	CKY	Winnipeg	50kw, ND, U
1000	U.S.	I-B	WGN	Chicago	50kw, DA-2, U
	U.S.	I-B	KOMO	Seattle	50kw, DA-N, U
	Mex.	I-B	XEOY	Mexico City	10kw, ND, U

1010	Can.	I-A	CFR	Calgary	50kw, DA-2, U
	Cuba	I-B	CMBQ	Havana	25kw, DA, U
				(presently 5kw, ND, U)	
1020	U.S.	I-A	KDKA	Pittsburgh	50kw, ND, U
1030	U.S.	I-A	WBZ	Boston	50kw, DA-1, U
1040	U.S.	I-A	WHO	Des Moines	50kw, ND, U
1050	Mex.	I-A	XEG	Monterrey	150kw, ND, U
1060	U.S.	I-B	KYW	Philadelphia	50kw, DA-1, U
	Mex.	I-B	XESED	Mexico City	50kw, DA-N, U
1070	U.S.	I-B	KNX	Los Angeles	50kw, DA-2, U
	Can.	I-B	CBA	Moncton, N.B.	50kw, ND, U
1080	U.S.	I-B	WTIC	Hartford	50kw, DA-N, U
	U.S.	I-B	KRLD	Dallas	50kw, DA-N, U
1090	U.S.	I-B	KAAY	Little Rock	50kw, DA-N, U
	U.S.	I-B	WBAL	Baltimore	50kw, DA-N, U
	Mex.	I-B	XERB	Rosarito, B.C.	50kw, DA-N, U
1100	U.S.	I-A	WJAE	Cleveland	50kw, DA-1, U
1110	U.S.	I-B	WFAB	Omaha	50kw, DA-N, U
	U.S.	I-B	WBT	Charlotte	50kw, DA-N, U
1120	U.S.	I-A	KMOX	Saint Louis	50kw, ND, U
1130	U.S.	I-B	KWKH	Shreveport	50kw, DA-N, U
	U.S.	I-B	WJZ	New York City	50kw, DA-N, U
	Can.	I-B	CKWX	Vancouver	50kw, DA-N, U
1140	U.S.	I-B	WRVA	Richmond	50kw, DA-1, U
	Mex.	I-B	XEMR	Monterrey	50kw, DA-N, U
				(presently 10kw, DA-N, U)	
1160	U.S.	I-A	KSL	Salt Lake City	50kw, ND, U
1170	U.S.	I-B	KVOO	Tulsa	50kw, DA-N, U
	U.S.	I-B	WWVA	Wheeling	50kw, DA-N, U
1180	U.S.	I-A	WHAM	Rochester	50kw, ND, U
1190	U.S.	I-B	KEX	Portland	50kw, DA-1, U
	U.S.	I-B	WOWO	Fort Wayne	50kw, DA-N, U
	Mex.	I-B	XEWK	Guadalajara, Jalisco	50kw, DA-N, U
				(presently 50kwD/10kwN, ND, U)	
1200	U.S.	I-A	WOAI	San Antonio	50kw, ND, U
1210	U.S.	I-A	WCAU	Philadelphia	50kw, ND, U
1220	Mex.	I-A	XEB	Mexico City	100kw, ND, U
1500	U.S.	I-B	WTOP	Washington D.C.	50kw, DA-2, U
	U.S.	I-B	KSTP	Saint Paul	50kw, DA-N, U
1510	U.S.	I-B	WLAC	Nashville	50kw, DA-N, U
	U.S.	I-B	KGA	Spokane	50kw, DA-N, U
1520	U.S.	I-B	WKBW	Buffalo	50kw, DA-1, U
	U.S.	I-B	KOMA	Oklahoma City	50kw, DA-N, U
1530	U.S.	I-B	KFBK	Sacramento	50kw, DA-1, U
	U.S.	I-B	WCKY	Cincinnati	50kw, DA-N, U
1540	P.I.	I-A	ZNS	Nassau	20kw, DA-1, U
	U.S.	I-B	KXEL	Waterloo	50kw, DA-N, U
1550	Can.	I-B	CBE	Windsor	10kw, DA-1, U
	Mex.	I-B	XEXB	Jalapa, Veracruz	10kw, ND, U
1560	U.S.	I-B	KFMC	Bakersfield	10kw, DA-1, U
	U.S.	I-B	WQXR	New York City	50kw, DA-2, U
	Cuba	I-B	CMZ	Santa Clara	10kw, DA, U
1570	Mex.	I-A	XERF	Villa Acuna	250kw, ND, U
				(presently 250kwD/500kwN, ND, U)	
1580	Can.	I-A	CBJ	Chicoutimi, Quebec	10kw, DA-1, U

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

FCC 74-135
08038

In the Matter of	)	
	)	
Amendment of Part 73 of the Commission's Rules to provide a one-hour advancement in the sign-on times of daytime AM broadcast stations to recoup the morning hour lost by the enactment of year-around-Daylight Saving Time.	)	Docket No. 19902

O R D E R

Adopted: February 6, 1974 Released: February 11, 1974

By the Commission:

1. On December 18, 1973, we adopted an Order (FCC 73-1324) defining the pre-sunrise operating privileges of daytime-only AM broadcast stations pending resolution of matters at issue in this proceeding. In general terms, the relief provided in that Order allows daytime stations with no foreign protection problems to "back up" their licensed sign-on times by one hour, using the facilities described in their pre-sunrise service authorizations (PSA's). Stations ineligible for a PSA were, by the blanket provisions of paragraph 7(f) of that Order, allowed to commence operation one hour prior to local sunrise with a power of 50 watts, if in so doing, no violation of existing international agreements would occur.

2. In the Notice of Inquiry and Proposed Rule Making (FCC 73-1323) issued in this proceeding, comments were requested on various related matters, including the status of PSA-holders with specified pre-sunrise powers of less than 50 watts, as well as an undetermined number of technically eligible licensees who have never applied for PSA's --presumably because of the severity of time and/or power restrictions under existing PSA rules. Paragraph 10(b), Notice.

3. After the adoption of the December 18 Order, a number of daytimers --including those holding low-power PSA's as well as those eligible therefor-- have requested special relief from pre-sunrise power restrictions which, it must be conceded, are unrealistically low in terms of effective community service; e.g., WJKM, Hartsville, Tennessee (3.1 watts); WNWI, Valparaiso, Indiana (10 watts); WAHT, Annville-Cleona, Pennsylvania (0.85 watts); KYMN, Northfield, Minnesota (4.2 watts); KOLM, Rochester, Minnesota (1.15 watts); WCTR, Natick, Massachusetts (1.6 watts); and WAVS, Fort Lauderdale, Florida (2.5 watts). Under existing PSA rules, these restrictions are designed to protect U.S. co-channel dominant stations to the west of the daytime station. Some of these licensees are attempting to compete in the same market with other daytime stations currently ineligible for a PSA but nonetheless permitted to operate one hour prior to local sunrise

with a power of 50 watts pursuant to paragraph 7(f) of the December 18 Order. Since all stations involved in this comparison operate on U.S. clear channels, the argument is made that to hold "eligible" stations to existing PSA power restrictions, while at the same time providing a flat 50-watt pre-sunrise operating power for stations presently ineligible for a PSA, is basically inequitable and should be corrected.

4. Despite the additional nighttime skywave interference which will be inflicted on the U.S. clear channel services by the grant of the relief requested, we have concluded that considerations of basic fairness require that, pending outcome of rule making, all daytime stations assigned to U.S. I-A and I-B clear channels (except those on U.S.-shared I-B clear channels, where such power would not provide foreign protection) be placed on the same 50-watt footing with respect to pre-sunrise operating power. In reaching this conclusion, we stress that we are in no way prejudging the outcome of rule making or of the specific issues raised in paragraph 10(b) of the Notice.

5. Authority for the adoption of this Order is contained in section 6 of PL 93-182 and section 4(i) of the Communications Act of 1934, as amended. Because of the urgent need for the interim adjustments herein ordered and because we interpret PL 93-182 as permitting these adjustments to be made without regard to hearing rights which might otherwise be asserted by affected fulltime stations under section 316 of the Communications Act, we find that compliance with the notice and effective date provisions of the Administrative Procedure Act (5 U.S.C. 553) is not required.

6. Accordingly, IT IS ORDERED, That effective February 20, 1974, and pending further action of the Commission, the Order (FCC 73-1324) adopted December 18, 1973, IS MODIFIED in the following particulars:

(a) Amend paragraph 7(d) to read as follows:
Class II (secondary) daytimers assigned to U.S. I-A and I-B clear channels and presently holding PSA's may achieve the one-hour advancement by adhering, throughout the year, to the sign-on times specified in outstanding Commission letters with the pre-sunrise facilities described in their PSA's: Provided, That if the authorized pre-sunrise power is less than 50 watts, the operating power may be increased to 50 watts during the hour immediately preceding local sunrise if no co-channel skywave interference to foreign stations would result (see paragraph 1, Appendix); and: Provided further, That on or before April 15, 1974, stations availing themselves of the 50-watt option shall give written notice to the Commission setting forth the date such operation commenced, describing the method whereby the power reduction from the licensed value has been achieved (if different from that presently employed for PSA operation), and including calculations to establish that the 50-watt pre-sunrise operation causes no objectionable interference to any foreign station. The PSA mode(s) of operation shall be continued until the standard (non-advanced) sign-on times specified in their station licenses, at which times they shall shift to the daytime facilities authorized therein.

(b) Add a new paragraph 7(g) to read as follows:
Class II (secondary) daytimers assigned to U.S. I-A and I-B clear channels and currently eligible for a PSA but who have not applied therefor because the allowable pre-sunrise power would be less than 50 watts may, on the effective date of this Order, commence operation one hour prior to local sunrise with a power of 50 watts into the daytime or critical hours antenna system, as appropriate, if no co-channel skywave interference to foreign stations would result (see paragraph 2, Appendix), and may continue such mode of operation until the standard (non-advanced) sign-on times specified in their station licenses: Provided, That on or before April 15, 1974, stations availing themselves of this privilege shall give written notice to the Commission setting forth the date such operation commenced, describing the method whereby the power reduction has been achieved, and including calculations to establish that the 50-watt pre-sunrise operation causes no objectionable interference to any foreign station; and: Provided further, That in no event shall operation under this paragraph commence earlier than 6:00 a.m. local time or local sunrise at the controlling foreign I-B clear channel station (if any) to the east, whichever is later - see paragraph 3, Appendix.

(c) Amend paragraph 8 to read as follows:
IT IS FURTHER ORDERED, That any licensee or permittee eligible for a PSA specifying a pre-sunrise power of more than 50 watts must apply for and obtain such PSA before the privileges conferred by this Order shall become operative.

7. IT IS FURTHER ORDERED, That the requests for special relief described in paragraph 3 of this Order ARE GRANTED to the extent indicated, and in all other respects ARE DENIED.

FEDERAL COMMUNICATIONS COMMISSION

Vincent J. Mullins
Secretary

Appendix

APPENDIX

1. The following daytime stations hold PSA's but are precluded from increasing PSA powers because of foreign interference conflicts:

KANN - Ogden, Utah
KBIL - Liberty, Mo.
KCLT - Lockhart, Tex.
KCOM - Comanche, Tex.
KGRI - Henderson, Tex.
KHYM - Gilmer, Tex.
KILR - Estherville, Iowa
KKIM - Albuquerque, N.M.
KLPR - Oklahoma City, Okla.
KORC - Mineral Wells, Tex.
KSTA - Coleman, Tex.
WKBA - Vinton, Va.
WKYE - Bristol, Tenn.
WLUX - Baton Rouge, La.
WSER - Elkton, Md.
WTYN - Tryon, N.C.
WXVA - Charleston, W. Va.
WYNA - Raleigh, N.C.
WYNX - Smyrna, Ga.

2. The following daytime stations are eligible for PSA's under section 73.99 of the rules but are precluded from 50-watt PSA operation because of foreign interference conflicts:

KGGH - Houston, Tex.
(new) - McComb, Miss.
WMAG - Forest, Miss.
WXTN - Lexington, Miss.

3. The following daytime stations are eligible for PSA's under section 73.99 of the rules but with sign-on times later than 6:00 a.m. local time because of their geographic relationship to foreign I-B clear channel stations:

KMLO - Vista, Cal.
KNBA - Vallejo, Cal.
KNCR - Fortuna, Cal.
WKDR - Plattsburgh, N.Y.

Public Law 93-182
93rd Congress, H. R. 11324
December 15, 1973

An Act

To provide for daylight saving time on a year-round basis for a two-year trial period, and to require the Federal Communications Commission to permit certain daytime broadcast stations to operate before local sunrise.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Emergency Daylight Saving Time Energy Conservation Act of 1973". Emergency Daylight Saving Time Energy Conservation Act of 1973.

SEC. 2. The Congress hereby finds and declares—

(1) that the United States faces severe energy shortages, especially in the winter of 1973–1974 and in the next several winters thereafter;

(2) that various studies of governmental and nongovernmental agencies indicate that year-round daylight saving time would produce an energy saving in electrical power consumption;

(3) that daylight saving time may yield energy savings in other areas besides electrical power consumption;

(4) that year-round daylight saving time could serve as an incentive for further energy conservation by individuals, companies, and the various governmental entities at all levels of government, and that such energy conservation efforts could lead 87 STAT. 707
to greatly expanded energy savings and help meet the projected 87 STAT. 708
energy shortages, and that such energy conservation efforts could include but not be limited to such actions as—

(A) lowering office, home, and store thermostats several degrees;

(B) limiting unnecessary automobile travel and holding down the speed of necessary automobile travel;

(C) using energy efficient automobiles;

(D) using public transportation whenever possible;

(E) turning off office air-conditioners and heating plants an hour earlier in the afternoon; and

(F) limiting unnecessary use of electric lights;

(5) that the use of year-round daylight saving time could have other beneficial effects on the public interest, including the reduction of crime, improved traffic safety, more daylight outdoor playtime for the children and youth of our Nation, greater utilization of parks and recreation areas, expanded economic opportunity through extension of daylight hours to peak shopping hours and through extension of domestic office hours to periods of greater overlap with the European Economic Community; and

(6) that the emergency nature of an energy shortage require the temporary enactment of daylight saving time.

SEC. 3. (a) Notwithstanding the provisions of section 3(a) of the
80 Stat. 107. Uniform Time Act of 1966 (15 U.S.C. 260a(a)), the standard of time of each zone established by the Act of March 19, 1918 (15 U.S.C.
40 Stat. 450; 261-264), as modified by the Act of March 4, 1921 (15 U.S.C. 265),
42 Stat. 1434; shall be advanced one hour and such time as so advanced shall for the
41 Stat. 446. purposes of such Act of March 19, 1918, as so modified, be the standard time of each such zone; except that any State with parts thereof in more than one time zone, and any State that lies entirely within one time zone and is not contiguous to any other State, may by law exempt the entire area of the State lying within one time zone from the provisions of this subsection.

(b) Notwithstanding any other provision of law, if a State, by proclamation of its Governor, makes a finding prior to the effective date of this Act, that an exemption from the operation of subsection (a) or a realinement of time zone limits is necessary to avoid undue hardship or to conserve fuel in such State or part thereof, the President or his designee may grant an exemption or realinement to such State.

(c) Any law in effect on October 27, 1973, adopted pursuant to
80 Stat. 107; section 3(a)(2) of the Uniform Time Act of 1966 by a State with parts
86 Stat. 116. thereof in more than one time zone, or adopted pursuant to section
15 USC 260. 3(a)(1) of such Act by a State that lies entirely within one time zone and is not contiguous to any other State, shall be held and considered to remain in effect as the exercise by that State of the exemption permitted by subsection (a) of this section unless that State, by law, provides that such exemption shall not apply during the effective period of this Act.

(d) The provisions of subsections (b) and (c) of section 3 and section
80 Stat. 109. 7 of the Uniform Time Act of 1966 shall apply to the provisions of
15 USC 267. this section.

Reports to Congress. 87 STAT. 708 87 STAT. 709

SEC. 4. (a) The Secretary of Transportation shall, on or before June 30, 1974, submit an interim report, and on or before June 30, 1975, submit a final report, to the Congress on the operation and effects of this Act. Each such report shall give particular attention to such effects on the use of energy in the United States, traffic safety, including the safety of children traveling to and from school, and the effect on school hours. Each such report shall also include such recommendations for legislation or other action as the Secretary may determine. The final report shall include any recommendations of the Secretary with respect to time zone limits.

(b) The Secretary of Transportation shall consult with the departments, agencies, and instrumentalities of the United States having information or expertise with respect to the operation and effects of this Act. Each such department, agency, and instrumentality shall exercise its powers, duties, and functions in such manner as will assist in carrying out the provisions of this section.

SEC. 5. The authority of the Secretary of Transportation, under the
40 Stat. 450; first section of the Act of March 19, 1918 (15 U.S.C. 261), to modify
80 Stat. 108. the limits of any time zone is suspended during the effective period of this Act.

SEC. 6. Notwithstanding any other law or any regulation issued under any such law, the Federal Communication Commission shall, consistent with any existing treaty or other agreement, make such adjustment by general rules, or by interim action pending such general rules, with respect to hours of operation of daytime standard amplitude modulation broadcast stations, as may be consistent with the public interest, including the public's interest in receiving interference-free service. Such general rules, or interim action, may include variances with respect to operating power and other technical operating characteristics. Subsequent to the adoption of such general rules, they may be varied with respect to particular stations and areas because of the exigencies in each case.

SEC. 7. This Act shall take effect at 2 o'clock antemeridian on the fourth Sunday which occurs after the date of enactment of this Act and shall terminate at 2 o'clock antemeridian on the last Sunday of April 1975. Effective date.

Approved December 15, 1973.

LEGISLATIVE HISTORY:

HOUSE REPORT No. 93-643 (Comm. on Interstate and Foreign Commerce).
SENATE REPORT No. 93-504 accompanying S. 2702 (Comm. on Commerce).
CONGRESSIONAL RECORD, Vol. 119 (1973):
Nov. 27, considered and passed House.
Dec. 4, considered and passed Senate, amended, in lieu of S. 2702.
Dec. 14, House and Senate agreed to conference report.
WEEKLY COMPILATION OF PRESIDENTIAL DOCUMENTS, Vol. 9, No. 50:
Dec. 15, Presidential statement.