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COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION
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"Extension of the Daylight Saving Time Period"

Mr. Chairman and Members of the Committee:

I am pleased to appear before you today to discuss the possible extension of the period during which the United States observes daylight saving time. I am accompanied by Robert I. Ross of the General Counsel's Office, which has the responsibility within the Department for interpreting the various time laws, and by Eric W. Beshers, Acting Director of the Office of Economics.

Before discussing the findings of that study, I would like to summarize briefly the history of daylight saving time in this country and the issues involved in future decision-making on this subject.

During World Wars I and II, daylight saving time was observed nationwide. In 1966, the Congress, through the Uniform Time Act, provided for the first nationwide peacetime observance of daylight saving time, for six months of the year (from the last Sunday in April through the last Sunday in October). This arrangement remained in effect until 1973 when the Congress enacted the Emergency Daylight Saving Time Energy Conservation Act which established for a two-year trial period year-round observance of daylight saving time. After evaluating the first four months of the experiment (from January to April 1974), the Department reported to the Congress that the public appeared to oppose

daylight saving time in January and February (and November and December), while favoring it in March and April. As a result, the Department recommended, and the Congress subsequently adopted, an eight-month system of daylight saving time (March through October) for 1975.

In an analysis of the second year of the experiment with daylight saving time, we found that a majority of the public responded favorably to the inclusion of March and April in the DST cycle. We also concluded that modest benefits might be realized in three significant areas -- in energy consumption, traffic fatalities, and violent crime -- by a permanent shift from the six-month DST period to an eight-month period.

The Department's recommendation to Congress was to extend the eight-month daylight saving time experiment for two more years to permit the collection of additional data and to undertake more thorough analysis. The Congress did not act on the Department's recommendation, and the experiment with an eight-month period of observance was abandoned after one year.

A primary purpose in extending the daylight saving time period during 1974-75 was to involve the American people actively in an energy conservation effort during the nation's first peacetime fuel shortage. Our study found that a two-month extension of daylight saving time to March and April might save one percent of electrical energy, or the equivalent of 100,000 barrels of oil daily, which was considered significant at a time when our nation was searching desperately for ways to conserve fuel. Since then, of course, the country's energy supply

situation has undergone significant adjustments, due in large part to the decontrol of fuel prices.

Fuel prices are now, and should continue to be, the main factor in controlling fuel use. However, ancillary conservation measures, such as daylight saving time, can provide additional opportunities for conserving fuel by, for example, reducing the need to illuminate homes and businesses by up to an hour per day. Still, the energy savings to be realized from extending daylight saving time would be small compared to those resulting from price decontrol.

Nevertheless, we still believe the energy and other benefits potentially derivable from an extension of daylight saving time are important. However, the factors underlying public acceptance of daylight saving time and the trade-offs involved in preserving its maximum benefits and satisfying public preferences are best discussed within the context of our overall study findings, which I will summarize briefly.

I should emphasize that these findings are based primarily on analyses conducted at the time of the 1974-75 experiments. The Department has not engaged in any extensive study of daylight saving time impacts since those experiments. Let me now turn to our study's findings.

Rationale for Daylight Saving Time System Selection

The traditional six-month daylight saving time system (May through October) is based on temperature, rather than on hours of daylight. Thus, it provides an equal number of days on either

side of the warmest days of the year which tend to occur toward the end of July.

A March to October daylight saving time period would make more sense than the present system, because it would provide an equal number of long daylight days on either side of the longest day of the year. One consideration, therefore, is the desirability of correcting the present imbalance by moving to new transition dates based on the maximum daylight conditions which exist from March until October.

Public Preference for Daylight Saving Time

A second consideration involved in the selection of transition dates is the general public preference for a March to October period of daylight saving time, weighed against some strong minority opposition to extending the length or changing the dates of the DST period.

Public opinion polls conducted during the 1975 eight-month DST experiment indicated that the public favored daylight saving time from March through October, by a ratio of nearly two to one.

The Roper Organization has conducted four polls on daylight saving time preference since the 1975 experiment. Roper polls conducted in March 1976, March 1980, and September 1981 indicated that approximately one-half of the public favored an extended period of daylight saving time from the beginning of March to the end of October, while approximately one-third of the public preferred a continuation of the present six-month period. It appears that, rather consistently over this period, a majority has

avored daylight saving time for the months of March and April. Nevertheless, opposition to daylight saving time continues to be registered rather consistently as well. During the 1975 experiment, 28 percent of respondents opposed daylight saving time in March and April. In the Roper polls, about 15 percent of the public favored no daylight saving time at all.

Results from the available public opinion polls indicated that the largest percentage of respondents opposed to daylight saving time live in areas that experience late sunrise problems under daylight saving time. This is because of their location relative to the standard meridians which define the time zones. These people tend to live near the western boundaries of the Eastern, Central and Mountain Time Zones, where sunrise times are always 30 to 60 minutes later than at the time zone centers. These people will experience later sunrises than the majority of the population under any time system and, thus, will often perceive daylight saving time as a problem. The intensity of this perception will vary depending on the actual clock times of these sunrises, which are controlled by the specific transition dates involved.

The two bills before the Committee, S. 240 and S. 1433, would extend daylight saving time beyond its current six-month duration. S. 240 would change the spring transition to daylight saving time from the last Sunday in April to the first Sunday in March. The other bill, S. 1433, would change the spring DST transition to the first Sunday in April. This bill also would extend the fall transition date from the last Sunday in October to the first

Sunday in November in order to include Halloween in the daylight saving time period.

Our study findings indicate that a transition to daylight saving time on the first Sunday in March would provide all areas of the nation with sunrise times which are no later than those occurring in late October under the existing six-month DST system. The actual clock times of sunrises during the first week in March would average approximately 7:30 a.m. Civil twilight, or dawn, would add thirty minutes of light before sunrise, sufficient to conduct outdoor activities by 7:00 a.m. This should be acceptable to a majority of the public who have indicated in public opinion polls that they awaken at or after 6:45 a.m.

The main impact of a first Sunday in March transition date would be felt by an estimated 15 percent of the U.S. population residing in the western regions of time zones. These areas would experience sunrises averaging approximately 8:00 a.m., with dawn at 7:30 a.m., or approximately 30 minutes later than the rest of the nation. The occurrence of these late sunrises at the very beginning of the daylight saving time period would present a somewhat abrupt change in morning light conditions, as sunrises would have gradually grown earlier from January through February, only to become suddenly later again with the advent of daylight saving time in March. Discomfort over later sunrises should be fairly short-lived, however, as morning light conditions improve more rapidly in March than in any other month of the year.

By the first week in April, DST sunrise times through the entire nation would average approximately 6:45 a.m., with dawn

occurring at 6:15 a.m. Areas in the western fringes of time zones would experience DST sunrises averaging 7:15 a.m., with dawn at 6:45 a.m. These sunrise times are no later than those experienced in late September under the existing six-month DST system. Since September has been accepted for years as a daylight saving time month, there is no reason to expect that similar DST sunrise times at the beginning of April would cause problems.

Moving the fall DST transition date to the first Sunday in November to include Halloween coverage would result in sunrise and sunset times throughout the nation which are five to ten minutes later than the latest sunrises and sunsets experienced under the present DST system in late October. The actual clock times of DST sunrises in the first week of November would average 7:43 a.m. with dawn at 7:13 a.m. The major advantage of extending daylight saving time into November would be the additional hour of evening light provided on Halloween during the commuter rush hour when most traffic fatalities occur. DST sunset times across the nation at the beginning of November would average approximately 6:15 p.m., with civil twilight or dusk providing sufficient light for outdoor activities until about 6:45 p.m. Areas in the western fringes of time zones would experience DST sunrises and sunsets in early November approximately 30 minutes later than the rest of the nation. The sunrise times, while only slightly later than those occurring in late October under the existing DST system, could be perceived by some as a problem. Conversely, the additional light

gained in the evening could be viewed as a benefit potentially offsetting the late sunrise problem.

Let me now briefly summarize the technical findings regarding daylight saving time benefits.

Energy Savings

As I have mentioned, we concluded that daylight saving time holds the potential for electricity savings of 1 percent in March and April, equivalent to roughly 100,000 barrels of oil per day, or about 6 million barrels over the two months. These savings were calculated from Federal Power Commission data for the daylight saving time transitions in the 1974-75 experiment. Due to this limited data sample, the findings have to be judged "probable," rather than conclusive. Theoretical studies of home heating fuel consumption identified small savings due to daylight saving time. No potential increases in travel demand and gasoline use due to daylight saving time were identified. Overall, the lack of actual data precluded a reliable estimation of total energy savings due to daylight saving time.

Motor Vehicle Fatalities, Total Population

With respect to motor vehicle safety, we were able to identify a 0.7 percent reduction in traffic fatalities due to daylight saving time in March and April 1974 compared to the comparable months in 1973 when we were under standard time. Applying this percentage reduction to 1983 nationwide fatality figures, we estimated that DST in March and April would save

approximately 45 lives, 3200 injuries, and \$24 million in economic costs. I should add that our analysts believe that these estimates are conservative and that their calculations understated the real reduction due to daylight saving time, which they judged to be on the order of 1.5 percent to 2 percent of traffic fatalities.

School-Age Child Safety

Following the experiment with year-round daylight saving time in 1974, the Department recommended that only March and April be included in the 1975 experiment because of the public's concern over the safety of children traveling to school on dark mornings. Results of public opinion polls conducted in 1974 showed that 38 percent of respondents expressed concern for school-age children's safety during year-round daylight saving time. During the 1975 March-April experiment, only 7 percent of respondents said they were concerned with the issue.

The final report of our study presented the results of both the Department of Transportation and the National Safety Council studies which showed that for the January-April 1974 period (i.e., under daylight saving time), school-age children were not subject to greater involvement in fatal accidents than the general population at any period of the day. A 1976 study of school-age fatalities performed by the National Bureau of Standards (NBS) used the same data base as the Department of Transportation, but analyzed only a subset of child fatalities in isolation from the general population and employed different statistical techniques. The National Bureau of Standards concluded that morning school-age

child pedestrian and pedalcyclist fatalities increased in January and February 1974 when daylight saving time was being observed, compared to the same period in 1973 when daylight saving time was not observed. No comparable increase in morning school-age fatalities, however, was found for the March and April period. While the January-February fatality increase was statistically significant, the National Bureau of Standards judged it impossible to attribute it to daylight saving time rather than to some other factor or combination of factors. I should note that our analysts did not agree with the methods and assumptions used by the Bureau to estimate these impacts. However, because of public concern for the safety of school-age children, the Department subsequently took the position that daylight saving time in January or February would not be desirable.

Results of a more recent DOT analysis comparing school-age child pedestrian and pedalcyclist fatalities before and after spring DST transitions in 1979-81 indicate that fatalities in the morning hours declined following the time change to DST in April 1979 and 1980, but increased in 1981. Overall, the figures for the three years show a net decline in school-age child morning fatalities following the change to daylight saving time. For the fall transition period, we do not have the data to judge whether daylight saving time would produce sufficient savings in Halloween fatalities to offset the potential for a small increase in morning deaths. In any event, school-age child fatalities during these limited times and for this limited category of pedestrians and pedalcyclists represent such small numbers that random occurrences

in any month or year can significantly affect the fatality trends. Of course, many other influences such as weather also play a role in affecting the rate. However, our findings do indicate that there is no evidence in the data that daylight saving time increases school-age child deaths in the morning during the spring DST transition.

Crime

With respect to crime, a study of daylight saving time impacts showed reductions in violent crimes of 10 to 13 percent in Washington, D.C. during DST months throughout a three-year period from 1973 to 1975. Due to time constraints, only data for Washington, D.C. were obtained for analysis during our study. We recognize that these are very limited results, and thus it is impossible to conclude with any confidence that comparable benefits would be found nationwide.

Changes in School Hours

With respect to school schedules, the Department of Health, Education and Welfare advised that only a small number of schools in two Midwest and Western States adjusted school hours during March and April 1975 as a consequence of daylight saving time.

Other Effects

There were no measurable effects of daylight saving time reported by Federal agencies in the areas of agriculture, labor, and park and recreational activities. Neither were there any

reported effects on domestic or international commerce, with the exception of the construction industry, which was opposed to year-round daylight saving time, favoring instead an April through October period.

International

The several countries of Europe have been seeking for many years uniform dates and times for transitioning from standard time to "summertime" (i.e., daylight saving time). The member countries of the Economic Commission for Europe have recommended that the beginning of summertime take place at 1:00 a.m. Greenwich Mean Time and that it end at 2:00 a.m. Greenwich Mean Time on the last Sunday of March and the last Sunday of September, respectively. Under this recommendation, these transition times and dates would be fixed for a five-year period during which no changes would be made.

Administrative Effects

During the 1974-75 daylight saving time experiment, the Governors of the 25 States bordering on or divided by time zone boundaries were asked whether these boundaries should be changed. Our concern was to determine whether extending DST for energy reasons conflicted with the arrangement of time zones, which are determined for commercial reasons. It is significant that even though many of these States experience the latest daylight saving time sunrises, the Governors, with one exception, favored retaining the present time zone boundaries. The exception

advocated having only two continental time zones. Based on this survey, the Department did not recommend any change in the existing time zone boundaries in its final report to Congress on DST impacts.

Summary of Findings

Our principal findings which bear on the extension of daylight saving time into March, April and November are the following:

- (1) The Department's studies of the various impact areas found no significant costs from extending daylight saving time to March and April.
- (2) Public opinion polls from 1974 to 1981 indicate a favorable public reaction to the observance of daylight saving time in March and April. Also, the public has consistently recorded its approval of daylight saving time in September and October.
- (3) Daylight saving time sunrises in the first week of March across the nation would be no later than those experienced in late October under the present six-month system. However, the occurrence of these later sunrises in the western areas of time zones at the very beginning of the daylight saving time period would cause a somewhat abrupt change in morning light conditions, which could be perceived as a problem. Daylight saving time sunrises during the first week of April would be no later than those currently experienced with DST in

September. Since there are no apparent problems with daylight saving time in September, there should be no problems with similar sunrise times in April. Sunrises and sunsets in the first week of November would be five to ten minutes later than the latest sunrises experienced under the present system.

- (4) In the key impact areas of electricity usage, motor vehicle fatalities and crime, our studies found a consistent pattern of modest, positive effects from daylight saving time. Further, we found no evidence of any effect of DST on school-age child morning fatalities in March or April. Adding an additional week of daylight saving time in order to include Halloween might result in a reduction in school-age child traffic fatalities in the evening. However, it also might increase morning traffic fatalities, and it is difficult to predict how this would net out.
- (5) A March to October daylight saving time period appears more logical than the present system for "saving" daylight because it would provide an equal number of days with long daylight hours on either side of the longest day of the year.

Recommendations

Mr. Chairman, the Department of Transportation supports an extension of the daylight saving time period beginning on the first Sunday in April and ending on the first Sunday in November.

These dates would preserve most of daylight saving time benefits and minimize the problems of late DST sunrises. This change would satisfy the general public preference for an extended period of daylight saving time. Extending the daylight saving time period to the first Sunday in March would be acceptable to the Department. However, a decision to extend the system into early March will of course involve tradeoffs to weigh potential reductions in fatalities and crimes, and other national benefits, against the detriments to those who will experience late sunrise problems in March. We witnessed colloquies in the House hearing last April on concerns of Midwestern communities about late sunrises in March. We are sensitive to these concerns, and we believe S. 1433 appears to provide the best balance for allaying these concerns, while still allowing for an extended period of daylight saving time.

Mr. Chairman, this completes my prepared statement. My colleagues and I would be happy to try to answer any questions you might have.