Daylight Saving Time

Corrie E. Clark
Analyst in Energy Policy

Lynn J. Cunningham
Senior Research Librarian

May 29, 2018
Summary

Daylight Saving Time (DST) is a period of the year between spring and fall when clocks in most parts of the United States are set one hour ahead of standard time. The time period for DST begins on the second Sunday in March and ends on the first Sunday in November. The beginning and ending dates are set in statute. Congressional interest in the potential benefits and costs of DST has resulted in changes to DST observance since it was first adopted in the United States.

The United States established standard time zones and DST through the Calder Act, also known as the Standard Time Act of 1918. The issue of consistency in time observance was further clarified by the Uniform Time Act of 1966. These laws as amended allow a state to exempt itself—or parts of the state that lie within a different time zone—from DST observance. These laws as amended also authorize the Department of Transportation (DOT) to regulate standard time zone boundaries and DST. The time period for DST was changed most recently in the Energy Policy Act of 2005 (P.L. 109-58).

Congress has required several agencies to study the effects of changes in DST observance. In 1974, DOT reported that the potential benefits to energy conservation, traffic safety, and reductions in violent crime were minimal. In 2008, the Department of Energy assessed the potential effects to national energy consumption of an extended DST, and found a reduction in total primary energy consumption of 0.02%. Other studies have examined potential health effects associated with the spring and fall transition to DST and found a cumulative effect of sleep loss and increased risk for incidence of acute myocardial infarction in specific subgroups.

Only Congress can change the length of the DST observance period; however, several states have proposed legislation to change their observance of DST. These efforts include proposals to effectively establish permanent DST and proposals to establish permanent standard time. Most of the proposals have not passed. One exception is Florida’s HB1013, which would institute year-round DST in Florida “if the United States Congress amends 15 U.S.C. s. 260a to authorize states to observe daylight saving time year-round.”

Congress may consider whether to make additional changes to DST observance or standard time. Several bills have been introduced in the 115th Congress that would make changes to standard time to effectively implement year-round DST. On March 12, 2018, the House Committee on Energy and Commerce sent a letter to DOT requesting updated information related to DST and standard time.
Contents

Introduction .................................................................................................................................................. 1
The Development of Standard Time and DST ......................................................................................... 1
  The Calder Act or the Standard Time Act of 1918 ................................................................................. 1
  The Uniform Time Act of 1966 .............................................................................................................. 1
  Exemptions from DST .......................................................................................................................... 2
Other Changes to Standard Time and DST ............................................................................................. 2
  Temporary Year-Round DST ................................................................................................................. 2
  Adjustments to the Length of DST Observance ................................................................................... 3
  Other Changes ....................................................................................................................................... 3
Potential Effects of DST ............................................................................................................................ 3
  Safety .................................................................................................................................................... 4
  Energy Savings ..................................................................................................................................... 4
  Health ................................................................................................................................................... 5
Department of Transportation’s Regulatory Process ............................................................................... 5
Selected State Actions to Change DST Observance ................................................................................ 6
Potential Issues for Congress .................................................................................................................... 7

Contacts

Author Contact Information ..................................................................................................................... 8
Introduction

Daylight Saving Time (DST) is a period of the year between spring and fall when clocks in most parts of the United States are set one hour ahead of standard time. The beginning and ending dates and times—the second Sunday in March at two o’clock ante meridian and the first Sunday in November at two o’clock ante meridian—are set in statute. Congressional interest in the potential benefits and costs of DST has resulted in changes to DST observance since it was first adopted in the United States.

Congress may consider whether to make additional changes to DST observance or standard time. Congress may also consider whether additional examination of potential benefits and costs of DST observance would be informative. This report presents a selected history of DST in the United States and includes a summary of potential effects, selected state actions related to DST or standard time, and federal legislation that has been introduced related to DST in the 115th Congress.

The Development of Standard Time and DST

The development of railroads led to the creation of a standard time in the United States. To reduce the confusion resulting from locally established “sun times” at railroad terminals, U.S. and Canadian railroads adopted four standard time zones in 1883. The four established times zones were the Eastern, Central, Mountain, and Pacific. Adoption of time zones at the local level was influenced by the time zones adopted by the railroads.

The Calder Act or the Standard Time Act of 1918

In 1918, Congress passed an act to provide standard time for the United States (also known as the Calder Act and the Standard Time Act of 1918). The act established five standard time zones; the fifth time zone was established to include Alaska. It authorized the Interstate Commerce Commission (ICC) to fix the time zone boundaries within the United States and to change them as necessary. The act also set a summer DST to begin on the last Sunday of March and conclude on the last Sunday in October. The adoption of DST in the United States was preceded by adoption of DST in Europe during World War I. After World War I, Congress abolished summer DST at the federal level, although it remained a local option with some states continuing to observe it.

The Uniform Time Act of 1966

In 1961, the Interstate Commerce Commission found the lack of nationwide consistency in time observance—including the observance and length of DST—confusing enough to recommend that
Congress reexamine “the entire field of standard time.” This reexamination resulted in the Uniform Time Act of 1966 (P.L. 89-387). The act mandated standard time within the established time zones and provided for advanced time: clocks would be advanced one hour beginning at 2:00 a.m. on the last Sunday in April and turned back one hour at 2:00 a.m. on the last Sunday in October. States were allowed to exempt themselves from DST as long as the entire state did so. If a state chose to observe DST, the time changes were required to begin and end on the established dates. The ICC was authorized with implementing the act until the authorities were transferred to the Department of Transportation (DOT), which occurred in October 1966 through the Department of Transportation Act (P.L. 89-670).

Exemptions from DST

In 1972, the Uniform Time Act was amended (P.L. 92-267) to allow states that were split between time zones to exempt either the entire state or that part of the state lying within a different time zone. The following states and territories do not observe DST: American Samoa, most of Arizona, Guam, Hawaii, the Northern Mariana Islands, Puerto Rico, and the Virgin Islands.

Other Changes to Standard Time and DST

Temporary Year-Round DST

Year-round DST has been implemented twice on a temporary basis in the United States. In 1942, Congress enacted a law to institute year-round DST, which became known as “War Time.” The law advanced the standard time for each time zone by one hour to be in effect until six months after the war or earlier if Congress were to require in a subsequent concurrent resolution. War Time concluded on the last Sunday in September 1945. During the 1973 oil embargo by the Organization of the Petroleum Exporting Countries (OPEC), Congress enacted the Emergency Daylight Saving Time Energy Conservation Act of 1973 (P.L. 93-182), which established a trial period of year-round DST, from January 6, 1974, to April 27, 1975. The act was amended in October 1974 by P.L. 93-434, which required a return to standard time for the period beginning October 27, 1974, and ending February 23, 1975, when DST resumed. When the trial period ended in 1975, the country returned to observing summer DST (with the aforementioned exceptions).

7 DOT regulates standard time zone boundaries and DST per 49 C.F.R. §71.
10 The act also required DOT to examine the effects of the act including safety of children traveling to and from school and school hours.
Adjustments to the Length of DST Observance

Congress has made additional changes to the Uniform Time Act. In 1986, Congress enacted P.L. 99-359, which changed the beginning of DST to the first Sunday in April. In 2005, Congress enacted the Energy Policy Act of 2005 (P.L. 109-58). Section 110 of this act amended the Uniform Time Act, by further changing DST to begin the second Sunday in March and end the first Sunday in November; this DST period remains in effect today. The act required the Secretary of the Department of Energy (DOE) to report to Congress on the impact of extended DST on energy consumption in the United States (see section on “Energy Savings”).

Other Changes

Other legislative changes addressed time zones. P.L. 106-564 amends the Calder Act to increase from eight to nine the number of standard time zones in the territory of the United States, creating Chamorro standard time, which includes Guam and the Commonwealth of the Northern Mariana Islands. It also amended the Uniform Time Act of 1966 to include Guam and the Northern Mariana Islands in the definition of “State.” In 2007, the 110th Congress enacted the America COMPETES Act (P.L. 110-69). Section 3013 of this act made changes to the Uniform Time Act regarding Standard Time in the United States, including a change to Idaho’s time zone.

Potential Effects of DST

Support and opposition to changes in DST observance often focus on its potential effects. Those in favor of extending DST observance reportedly argue that the extended daylight in the evening promotes economic activity, including tourism. Those against extending DST observance reportedly argue that losing an hour of daylight in the morning could negatively affect golf course operations, ski resorts, and schoolchildren’s morning commutes. A number of studies have been conducted on DST’s effects on safety, energy savings, and health. A selection of these—including studies mandated by Congress—is discussed in this section. This is not a comprehensive review of the literature.

Congress has required several agencies to evaluate the effects of DST. DOT provided an interim evaluation and final report on the operation and effects of DST in 1974 and 1975. The interim

---

12 By including Guam and the Northern Mariana Islands in the definition of “State,” these territories may exempt themselves from DST as provided in the Uniform Time Act of 1966.
13 CRS identified no DST-related legislation or legislation to amend the Uniform Time Act after enactment of P.L. 110-69 until the 115th Congress. CRS searched the Congress.gov database to identify DST-related legislation using a combination of keywords or phrases and proximity locators. Keywords and phrases included the following: daylight saving time; D.S.T.; permanent; Uniform Time Act of 1966; standard time; saving sunshine; and time zone(s).
The report’s findings were inconclusive, stating that the observed effects were “so small that they could not in general be reliably separated from effects of other changes occurring at the time.” DOT reported that “modest overall benefits might be realized by a shift from the historic six-month DST (May through October) [to year-round DST] in areas of energy conservation, overall traffic safety, and reduced violent crime.” DOT also reported that these potential benefits would be minimal and difficult to distinguish from seasonal variations and fluctuations in energy prices.

**Safety**

After DOT submitted the report to Congress in 1975, Congress directed the National Bureau of Standards (NBS) to conduct a technical evaluation of the DOT study and to deliver a report to Congress. In its report, NBS found no significant energy savings or differences in traffic fatalities. Although statistically significant evidence was found of increased fatalities among school-age children in the mornings during the four-month period January-April 1974 as compared with the same period (non-DST) of 1973, NBS stated that

> This increase cannot be simply interpreted as ‘DST effect,’ in view of the many other factors that influence traffic fatalities. When the months of January through April are considered individually, there is no statistically significant difference between 1973 and 1974 with respect to school-age children fatal accidents in the morning for the months of March and April.

Other studies have found that the short-term effect of DST on crashes is not statistically significant. Some reviews of the scientific literature have found that the long-term effects of DST suggest a positive effect. One such report noted, however, that the results “may be attributable to factors other than light.”

**Energy Savings**

As part of P.L. 109-58, Congress directed DOE to evaluate potential energy savings that may result from extending DST. In 2008, DOE submitted a report to Congress on the effects of extended DST on U.S. energy consumption. DOE found that the total electricity savings associated with extended DST corresponded to 0.03% of electricity consumption in 2007. In terms of primary energy consumption, this represents approximately 0.02% of total U.S. energy consumption.

---

17 Ibid., p. ES-1.
18 Ibid., p. ES-2.
19 The National Bureau of Standards was renamed the National Institute of Standards and Technology (NIST) in 1988.
21 Ibid., p. E-3.
24 Extended DST refers to changing the start date from the first Sunday in April to the second Sunday in March and the end date from the last Sunday in October to the first Sunday in November. U.S. Department of Energy (DOE), *Impact of Extended Daylight Saving Time on National Energy Consumption: Report to Congress*, October 2008.
consumption in 2007.\textsuperscript{25} Regionally, areas in the northern United States exhibited larger electricity savings than areas in the southern United States. DOE reported that there was insufficient statistical evidence to indicate whether extended DST “had any measurable impact on motor gasoline consumption for passenger vehicles or traffic volume in 2007.”\textsuperscript{26}

Literature reviews have reported similar savings as reported by DOE, although at least one empirical study found that DST increases electricity demand.\textsuperscript{27} Aries and Newsham (2008) concluded that “existing knowledge about how DST affects electricity use is limited, incomplete, or contradictory.”\textsuperscript{28} Havranek et al. (2018) conducted a literature review and found that “electricity savings are larger for countries [or areas] farther away from the equator, while subtropical regions consume more electricity because of DST.”\textsuperscript{29}

**Health**

Several studies have examined potential health effects related to the semiannual changing of the clock per DST. Harrison (2013) reviewed the effect of DST on sleep, and found that data from the spring and fall transition periods suggest a cumulative effect of sleep loss.\textsuperscript{30} Jiddou et al. (2013) evaluated the incidence of acute myocardial infarction (AMI) with transitions to and from DST, and found evidence consistent with previously reported trends that “shifts to and from DST might be associated with transient increases and decreases in the incidence of AMI, respectively.”\textsuperscript{31} A study from 2015 concluded that “specific subgroups such as men and persons with a history of AMI or prior treatment with ACE inhibitors may have a higher risk for AMI during DST.”\textsuperscript{32}

**Department of Transportation’s Regulatory Process**

Although states may exempt themselves, in whole or in part, from DST, they cannot independently change time zone or alter the length of DST (i.e., DST begins and ends on statutorily mandated dates). There are two ways in which an area can be moved from one time zone to another: by regulation or by statute.

Under the Standard Time Act of 1918, as amended by the Uniform Time Act of 1966, moving a state or an area within a state from one time zone to another requires DOT regulation. Such a

\textsuperscript{25} DOE 2008, p. i.
\textsuperscript{26} Ibid. p. 2.
\textsuperscript{31} Acute myocardial infarction (AMI) is the medical name for a heart attack, which refers to a blockage of blood flow to the heart muscle. M.R. Jiddou et al. (2013), “Incidence of Myocardial Infarction with Shifts to and from Daylight Savings Time,” *The American Journal of Cardiology*, 111(5), 631-5.
request can be made only by certain political authorities in an area. For example, if the request for change is for one or more counties, the board (or boards) of county commissioners would make the request. If the request is for a state, the governor or the legislature would make the request.

The principles for deciding whether to change the time zone are the area’s “convenience of commerce and the existing junction points and division points of common carriers engaged in interstate or foreign commerce.” The convenience of commerce is defined broadly to consider such circumstances as the shipment of goods within the community; the origin of television and radio broadcasts; the areas where most residents work, attend school, worship, or receive health care; the location of airports, railways, and bus stations; and the major elements of the community’s economy.

After receiving a request, DOT determines whether it meets the minimum statutory criteria before issuing a notice of proposed rulemaking, under which it would solicit public comment and schedule a public hearing. Usually the hearing is held in the area requesting the change so that affected parties can be represented. After the comment period closes, comments are reviewed and appropriate final action is taken. If the Secretary agrees that the statutory requirement has been met, the change would be instituted, usually at the next changeover to or from DST.

Selected State Actions to Change DST Observance

Even though a state cannot unilaterally go on year-round DST, several states have initiated efforts to change the summer observance of DST. These include efforts to establish permanent DST as well as efforts to establish permanent standard time. CRS identified 16 states that have proposed legislation to establish some variation of permanent DST since 2015: Alabama, California, Colorado, Connecticut, Florida, Idaho, Illinois, Iowa, Mississippi, Missouri, New Mexico, Nevada, Oklahoma, South Carolina, Washington, and Wyoming. In the case of Idaho, the proposal would only apply to the 10 northern counties that are currently in Pacific Standard Time should the state of Washington move from Pacific Standard Time to Mountain Standard Time (i.e., one hour ahead) and exempt itself from DST, effectively implementing year-round DST.

33 According to DOT, “DOT will generally begin a rulemaking proceeding to change a time zone boundary if the highest elected officials in the area submit a petition requesting a time zone change and provide adequate data supporting the proposed change.” See DOT, “Standard Time Zone Boundary in Southwest Indiana,” 72 Federal Register 54367, September 25, 2007.


36 Ibid.

37 CRS identified state actions through a search (conducted on May 22, 2018) that included news articles, the National Council of State Legislatures website, and Lexis Advanced.


39 These were the states that were identified in the search conducted on May 22, 2018, and may not be an inclusive list.

40 Implementing year-round DST would advance time by one hour compared to the previous time. Requesting DOT to change a state’s time zone to one that is one hour ahead and then exempting the state from DST observance would achieve the same effect—advance time by one hour compared to the previous time. For more on Idaho’s proposal, see (continued...)
Prior to 2015, legislation was introduced in the Louisiana legislature in 2003, 2006, and 2010 that sought to make DST permanent standard time. In addition, four states in New England—Maine, Massachusetts, New Hampshire, and Rhode Island—have reportedly created commissions or introduced proposals to move to year-round DST. In the case of New England, the proposals would reportedly change the standard time zone from Eastern Standard Time to Atlantic Standard Time (i.e., one hour ahead), which would “effectively adopt daylight saving time all year round.”

While some states have proposed legislation to establish permanent DST, other states have proposed legislation to establish permanent standard time. CRS identified 17 states that have proposed such legislation since 2015: Alabama, Alaska, California, Connecticut, Florida, Kansas, Michigan, Missouri, Nebraska, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming. In eight of these states, legislators have proposed both permanent DST and permanent standard time legislation: Alabama, California, Connecticut, Florida, Missouri, Oklahoma, Washington, and Wyoming.

Several states have also introduced legislation to study the effects of DST or the effects of changing the observance of DST. These include Louisiana, New York, South Carolina, Virginia, and Washington.

Most of the legislative proposals in recent years have not passed. One exception is Florida’s H.B. 1013, the Sunshine Protection Act. On March 23, 2018, Governor Scott approved H.B. 1013, which would institute year-round DST in Florida “if the United States Congress amends 15 U.S.C. s. 260a to authorize states to observe daylight saving time year-round.”

Potential Issues for Congress

Congress may consider whether to make additional changes to DST observance or standard time. In the 115th Congress, four bills have been introduced that would make changes to standard time. The four bills introduced are two sets of related House and Senate bills: the Sunshine State Act (S. 2536 and H.R. 5278) and the Sunshine Protection Act of 2018 (S. 2537 and H.R. 5279). The

(...continued)


44 These were the states that were identified in the search conducted on May 22, 2018, and may not be an inclusive list.


Sunshine State Act would make daylight saving time permanent in the state of Florida by setting the standard time of Florida advanced one hour (effectively moving it from Eastern Standard Time to Atlantic Standard Time). The Sunshine Protection Act of 2018 would make daylight saving time permanent for most states and areas in the United States by advancing standard time one hour (with exemptions for states and areas that do not observe DST on the day before enactment).

Information on the benefits and costs of DST with its current length compared to year-round observance (or other variations) may be of congressional interest. On March 12, 2018, the House Committee on Energy and Commerce sent a letter to the Department of Transportation requesting updated information related to DST and standard time “to more fully appreciate the various policy factors associated with changing between Standard and [DST].”

Author Contact Information

Corrie E. Clark
Analyst in Energy Policy
cclark@crs.loc.gov, 7-7213

Lynn J. Cunningham
Senior Research Librarian
lcunningham@crs.loc.gov, 7-8971

---