



DAYLIGHT SAVING TIME

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Daylight Saving Time (DST) will begin at 2 a.m. local time, Sunday, March 12, 2017. During this change, time will move *forward* by one hour from 2 a.m. to 3 a.m. Clocks and timepieces will need to be adjusted accordingly. It is now 10 years since the United States set new dates for DST—to commence on the second Sunday of March, and to end on the first Sunday of November, one week later than previously—with Canadian jurisdictions following suit.

This paper examines basic questions, history, and recent events related to both Standard Time and Daylight Saving Time.

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INTRODUCTION

Daylight Saving Time (DST) will begin at 2 a.m. local time, Sunday, March 12, 2017, with time moving forward by one hour from 2 a.m. to 3 a.m. Clocks and timepieces will need to be adjusted accordingly.

In 2007 the United States extended the period of DST by moving the start date from the first Sunday in April to the second Sunday of March and the end date from the last Sunday in October to the first Sunday of November. As part of its energy saving *Energy Policy Act of 2005*, this adds four or five weeks to DST. Provinces and territories that observe DST, like Ontario, saw the advantage of remaining synchronized with the United States, and amended their time statutes accordingly.

This paper examines basic questions, history, and recent events related to both Standard Time and DST.¹

Recent News

A March 2015 CBC [article](#) about abolishing DST included a survey that received almost 19,000 responses. Of these, 60% voted to abolish DST, 28% voted to implement it year round, and only 12% supported maintaining the status quo.

While most of the United States follows daylight saving time, the issue of DST continues to be controversial. The Department of Transportation is responsible for administering DST, but states may opt out if they so choose. Currently, Hawaii and most of Arizona do not observe DST; bills have also been considered in a number of states in the past few years, including Florida, Mississippi, New Mexico, Oregon, Utah, and Texas, but none have passed.²

WHAT IS DAYLIGHT SAVING TIME?

Daylight Saving Time, the practice of advancing the clock one hour (usually for a period of approximately six months, also known as “summer time” in some countries), is a derivation of Standard Time. DST seeks to shift the hours of human activity to make better use of the daylight.³ It provides a longer period of daylight to enjoy outdoor activities during summer evenings. The decline in the use of artificial light and appliances is believed to conserve fuel and energy, thereby generating financial savings.

Germany was the first country to adopt DST, in 1916. During World War I, clocks in several other countries, including Australia, Denmark, Great Britain, the

¹ DST is sometimes incorrectly referred to as Daylight Savings Time.

² National Institute of Standards and Technology, [Local Time: Frequently Asked Questions](#), December 4, 2015; all links accessed April 30, 2017.

³ David S. Prerau, *Seize the Daylight: The Curious and Contentious Story of Daylight Saving Time* (New York: Thunder’s Mouth Press, 2005), p. xv.

Netherlands, and the United States, were advanced one hour as an energy conservation measure. In the United States, this proved so unpopular that it was repealed after the war.

During World War II the US Congress reinstated DST from February 2, 1942 until September 30, 1945. England used “double summer time,” advancing the clocks two hours from Standard Time in the summer and one hour in the winter. In Canada, federal legislation established DST during a limited portion of the Second World War.

WHAT IS STANDARD TIME?

Sir Sandford Fleming, a Canadian railroad planner, engineer, and citizen of Peterborough, Ontario is widely credited with inventing the worldwide system of standard time zones.

Before the establishment of standard time, local time (also known as solar time) was determined by the position of the sun at midday, and varied from one community to another. Before the adoption of standard time, midday in Kingston was 12 minutes later than midday in Montreal and thirteen minutes before midday noon in Toronto. With the introduction of railways, local time became highly inconvenient and inefficient. Travellers sometimes carried a number of watches, or one with six different faces, each labelled with the name of a different city. Train schedules based on local times created nightmares for railway stationmasters and chaos for a transcontinental railway.⁴

The solution was to adopt a system by which the clocks would read consistently in one large region. Railways began using Greenwich Mean Time (GMT) as the Standard Time for England, Scotland, and Wales in the 1840s, although it would not become the legal standard until 1880.

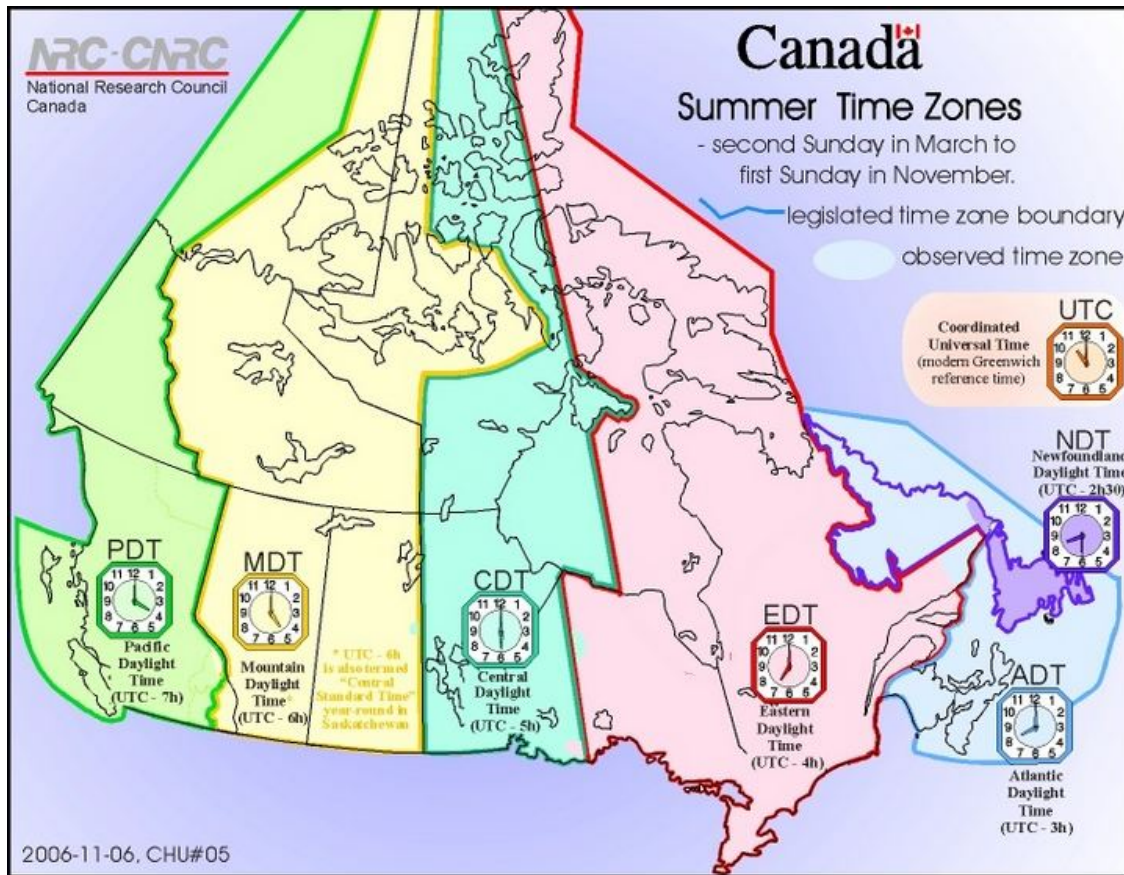
On November 18, 1883 North American railways adopted a system of one-hour time zones proposed by William F. Allen, secretary of the General Time Convention. Fleming, acting as chair of the standing committee on time for the American Society of Civil Engineers, was a key player in the process of encouraging the US Congress to call the 1884 International Prime Meridian Conference.⁵

Time Zones of Canada

The following figure shows the six time zones in Canada, with their hours from the Greenwich meridian:

⁴ The CRB Foundation Heritage Project, “Sandford Fleming makes trains run on time,” (1998).

⁵ *Dictionary of Canadian Biography Online*, “[Fleming, Sir Sandford](#).”



Map reproduced with the kind permission of the Institute for National Measurement Standards, National Research Council of Canada.

REGULATION OF DST IN CANADA

While the federal government regulated DST as national policy during World War II, provincial and territorial governments now regulate DST through various statutes.

Ontario

In 1895 Ontario enacted a time statute known as *An Act respecting the Legal Meaning of Expressions relative to Time*. The first section stated that expressions of time in the Province would refer to Standard Time, and provided for two time zones. The parts of the province to the east and west of 87° W longitude (present day Terrace Bay) would be deemed to be five and six hours (respectively) behind Greenwich Time. The 1895 boundary between the Eastern and Central Time Zones fell about 225 km. east of today's boundary of 90° W longitude near Shebandowan, a small hamlet west of Thunder Bay.

No reference to "Daylight Saving Time" was made in any Ontario time statute until the passage in 1986 of a private member's bill introduced by MPP Ross McClellan (Bellwoods), saying that DST would start on the first Sunday in April

and end the last Sunday of October. This provided for nearly seven months of DST in Ontario, an adjustment consistent with action taken by the US Congress earlier that year.⁶

Ontario's Time Zone Anomalies

The Northwestern Ontario communities of Atikokan, Pickle Lake, and Mishkeegogamang (formerly New Osnaburgh) are located west of the 90th meridian and therefore fall within the Central Time Zone. Nonetheless, both Atikokan and Pickle Lake observe Eastern Time. Neither Atikokan nor Mishkeegomang observes DST. Similar time zone “anomalies” are located throughout Canada, often near time zone boundaries.

Saskatchewan

By remaining on Central Standard Time (CST) year round, Saskatchewan is the only province that does not observe DST. The question of DST in Saskatchewan has been overshadowed by the question of whether to accept Mountain Standard Time (MST) or CST as the uniform time in the province. Some in the province argue that, in a sense, Saskatchewan is already observing DST. This is because Saskatchewan observes CST instead of MST (the time associated with the 105° W meridian that runs through the middle of the province).

ONTARIO'S RESPONSE TO THE US *ENERGY POLICY ACT OF 2005*

The Ministry of the Attorney General (AG) administers Ontario's *Time Act*.⁷ In 2005 Attorney General Michael Bryant asked his Parliamentary Assistant (PA), David Zimmer, to investigate the impact that the extension of DST could have on the different sectors in Ontario. According to the Attorney General:

Representatives from finance and capital markets, trade, manufacturing and industry unanimously urged us to harmonize daylight saving with the US. In fact, they told us that any misalignment could have a real and negative impact, namely: trade disruption as well as cost coordination, delivery system supply chain and border pressures.⁸

In October 2005 the AG announced that Ontario would synchronize its DST schedule with the United States. PA Zimmer told the *National Post* that “a good, solid 75% [of Ontarians consulted] were in favour of extending DST.”⁹ Ontario Regulation 111/06 under the *Time Act* originally established the DST conventions

⁶ Ministry of Municipal Affairs, *News Release*, March 10, 1987.

⁷ See the [Time Act](#).

⁸ Legislative Assembly, *Hansard*, 2nd Sess., 38th Parl. ([October 20, 2005](#)).

⁹ Lee Greenberg, “Ontario to extend daylight savings,” *National Post*, October 21, 2005, p. A4.

to conform with the changes in the US.¹⁰ In 2010 the regulation was revoked and the *Time Act* amended to set the start and finish dates for DST.

CONFLICTING VIEWS ON DAYLIGHT SAVING TIME

Some people resent the twice a year inconvenience of resetting their clocks and the time on their various appliances.¹¹ Others dislike adjusting their sleeping patterns and some with sleep problems find the change disruptive and disorienting. They complain that adjusting to DST or back to Standard Time is “like getting jet lag without even leaving home.”¹²

Stanley Coren, who authored the book *Sleep Thieves*, published data claiming that the spring shift to DST increases driver fatigue resulting in an increase in automobile collisions.¹³ Other experts dispute these claims.¹⁴ However, a Hamilton sleep disorder specialist has observed that the loss of as little as one hour of sleep (as happens during the shift to DST) can have a significant impact on individuals already suffering from sleep deprivation.¹⁵ A Swedish study noted that since 1987, the number of heart attacks rises about 5% during the first week of DST due to disruption of sleep patterns and biological rhythms.¹⁶

A study from the University of Turku in Finland says that the DST may lead to an 8% higher rate of strokes in the two days after DST changes.¹⁷

Researchers at Stanford and Johns Hopkins universities reported in the journal *Sleep Medicine* that there may be a link between the spring change to DST and an increase in fatal auto accidents on the Monday following the change. Reviewing records on fatalities kept by the US National Highway Transportation Safety Administration from 1974 to 1995, data showed that an average of 78.2 fatalities had occurred during the weeks prior to the shift while an average of 83.5 fatalities occurred immediately following.¹⁸ Several economists from British Columbia have suggested that disrupted sleep routines lead to unusual declines on the stock market on the Monday following the start/end of DST.¹⁹

¹⁰ See [O. Reg. 111/06](#).

¹¹ Sheila Danzig, [End Daylight Saving time](#), 1997.

¹² Wood, “Changing clocks a sore subject.”

¹³ Stanley Coren, “[Sleep Deficit, Fatal Accidents and the Spring Shift to Daylight Savings Time](#),” (1998). Presented at INABIS '98, 5th Internet World Congress at McMaster University, Canada, December 7-16, 1998.

¹⁴ Nicolas van Rijn, “Accident unrelated to time change: study – Statistics show losing sleep has little or no effect,” *Toronto Star*, October 17, 1998, p. A4.

¹⁵ Suzanne Morrison, “All work and no sleep plays havoc with lives; Studies say lack of sleep causes premature aging, weakens immune system and leads to accidents,” *The Hamilton Spectator*, March 31, 2001, p. A1.

¹⁶ Charles Choi, “Spring Forward or Not?,” *Scientific American*, March 2009, p.18.

¹⁷ American Academy of Neurology, [Does Daylight Saving Time Increase Risk of Stroke?](#), February 29, 2017.

¹⁸ Ibid.

¹⁹ Derek DeCloet, “Thank God it’s Monday: Don’t Call your Broker Yet (Stock Market Decline Follows Switch to Daylight Savings Time),” *Canadian Business*, April 3, 2000, pp. 19-20.