

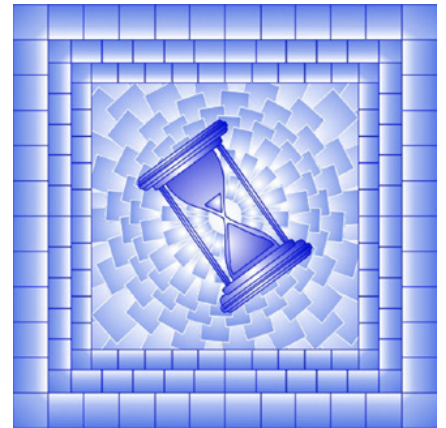
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## Prices Analytical Series

# Transportation and Supply Chain Indices

by Alexandre Prescott, Maryam Mustafa, Soonmo Kwon and Alice Xu

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# Transportation and supply chain indices

by **Alexandre Prescott, Maryam Mustafa, Soonmo Kwon and Alice Xu**

Understanding the dynamics of Canada’s supply chains and transportation networks is essential for analyzing and measuring economic resilience and performance, supporting evidence-based decision-making in a complex global trade environment. With the support of Transport Canada, Statistics Canada developed two experimental indicators: the **Transportation Services Index (TSI)** and the **Supply Chain Services Price Index (SCSPI)** to offer valuable insights into these systems. The SCSPI tracks price changes across various aspects of transportation within the supply chain, helping identify inflationary pressures and transport challenges. Meanwhile, the TSI measures the volume of goods transported across modes, providing an updated view of economic activity and logistics efficiency.

## Transportation Services Index (TSI)

The TSI is a Laspeyres-type volume index that includes domestic “for-hire” freight transportation only, specified under NAICS 48. For-hire transportation consists of freight provided by a firm to external customers for a fee. The TSI does not include taxi services, paid ride services in personal motor vehicles, intercity bus services, in-house transportation (vehicles owned and operated by private firms for their own use), or passenger transport services. The index does not include international or coastal waterborne movements, private trucking, courier services, or the postal service. The index is available and is calculated monthly, contingent upon data availability.

This differentiates the TSI from Gross Domestic Product (GDP) estimates, which measure the total value of all final goods and services produced across the entire economy, including government-provided nonmarket output and industries unrelated to transportation. The TSI tracks real changes in movements of goods across the transportation industry. GDP also incorporates all transportation activities beyond the scope of the TSI, such as private trucking and courier services.

### Index Calculation

The Canadian TSI is designed to provide a national volume indicator that is methodologically comparable to other international transportation volume indexes. Its construction is aligned with the framework developed by the United States Bureau of Transportation Statistics for the U.S. Transportation Services Index<sup>1</sup>, thereby facilitating bilateral comparability. This alignment is particularly relevant given the high degree of integration between Canadian and U.S. transportation systems through cross-border trade flows.

The elementary volume indexes are aggregated across all five modes of transportation to construct the TSI using a fixed-base, weighted arithmetic average, based on the weights described in the following section. The aggregation structure can be found in Appendix B. The monthly index for TSI is given by:

$$TSI^t = TSI^{t-1} \sum_i \left[ \left( VI_i^t \right) w_i^t \right] \text{ for } t \geq 1$$

$TSI^t$ : The total monthly TSI at time t

$w_i^t$ : Weight of transportation mode  $i$  in period  $t$

$VI_i^t$ : Volume index value for a mode of transportation  $i$  for period  $t$

The TSI is constructed using data compiled from various Statistics Canada sources. For each transportation industry, a Volume Index (VI) is computed as a volume relative, defined as the ratio of current-period domestic

1. [Transportation Services Index - US Bureau of Transportation Statistics](#)

volume to the previous period ( $t / t-1$ ), and with volumes measured in their appropriate physical units (e.g., tonne, cubic meter, kilogram). These volume relatives form the elementary indexes used in the TSI. Physical units are kept consistent across reference periods for each mode of transport; when unit definitions or measurement practices change, appropriate conversions are applied to maintain continuity. In cases where direct volume data are unavailable due to data limitations, an appropriate and methodologically comparable proxy estimate is employed to maintain coherence in the series.

With each data calculation, estimates for the previous six months may be revised. Furthermore, the series is subject to an annual revision when the data for June of the subsequent reference year becomes available.

## Weights

Using Supply Use Tables (SUT),<sup>2</sup> individual industry weights are established to aggregate to the total TSI. By leveraging detailed data from the SUT, we can enhance the accuracy of indices by capturing a detailed view of the transportation industry output, highlighting how different sectors contribute to overall economic activity. The distribution of weights for each included industry is as follows:

**Table 1**  
**Classification**

<b>(NAICS 2022)</b>	<b>Weights</b>
	percent
NAICS 481: Air transportation	2
NAICS 482: Rail transportation	16
NAICS 4861: Oil Pipeline Transportation	7
NAICS 4862: Natural Gas Pipeline Transportation	6
NAICS 484: Truck transportation	69

Source: Statistics Canada.

## Seasonal Adjustment

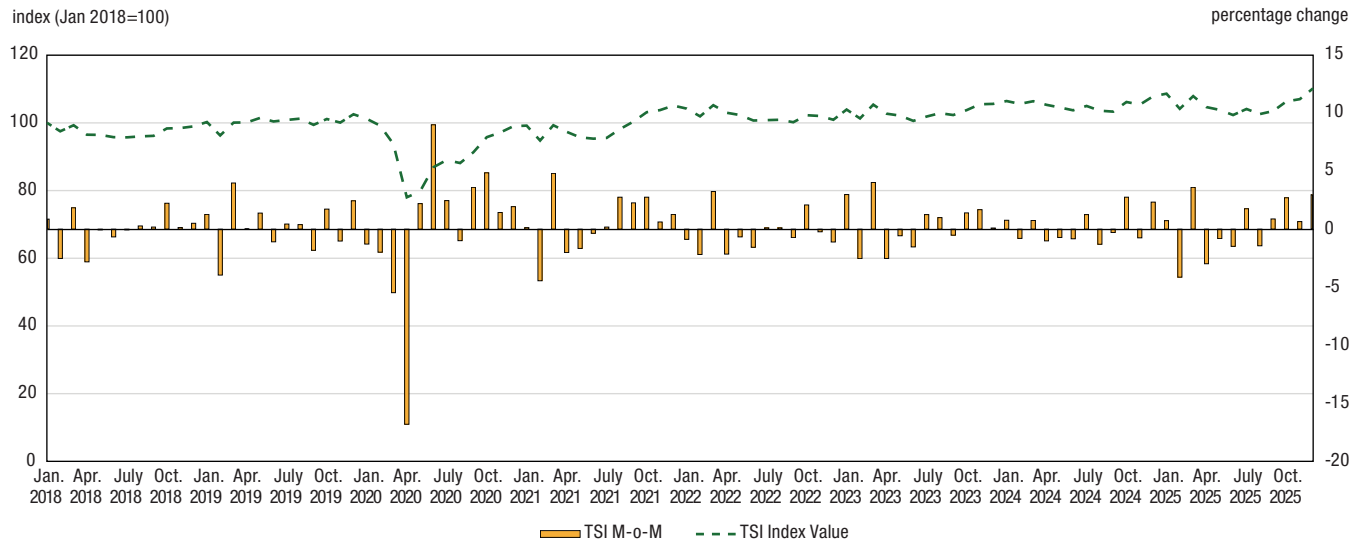
Seasonal adjustment of the TSI refines the measurement of domestic transportation by filtering out predictable, recurring fluctuations—such as holiday effects or weather-related patterns—that can obscure true economic signals. This process enables more meaningful comparisons across time periods and strengthens the reliability of trend analysis, forecasting, and policy evaluation. The TSI utilizes the X-13 ARIMA-SEATS methodology, developed by the U.S. Census Bureau, to perform seasonal adjustments. Currently seasonal adjustment is only calculated at the Total TSI level.

## Results and Analysis

Since 2020, TSI has shown overall growth and TSI volume levels have remained above January 2020 levels, surpassing them initially from March 2021. After declining monthly from -2.0% to -16.8% in February to April 2020, TSI has shown generally steady growth starting from May 2020. During these consecutive months of decline in 2020, the TSI showed its largest year-over-year decline (-22.1%) in April 2020. When looking at its pandemic recovery, TSI showed its first year-over-year growth in March 2021 of +5.9%. Since the pandemic decline and recovery, the TSI has shown some stability with smaller movements overall, including general growth from year to year.

2. [Supply and Use Tables](#)

**Chart 1**  
**Comparing TSI (Jan 2018=100) Index values vs Month-over-Month Change**



Source: Statistics Canada Transportation Services Index (Appendix A).

The comparison between the seasonally adjusted and unadjusted TSI highlights underlying economic tendencies and movements in domestic transportation volumes, removing factors such as number of days in a month and any seasonal or holiday impacts. The seasonally adjusted TSI surpassed its December 2019 level in October 2021 and remained above that level through September 2025, demonstrating the overall growth since the decline in 2020 due to the pandemic restrictions.



## Weights

Using Supply-Use Tables, individual industry weights are established to aggregate to the total SCSPI. By leveraging detailed data from the SUT, we can enhance the accuracy of indices by capturing intricate details of the transport industries, thereby offering a granular view of economic activities. The distribution of weights for each included industry is as follows:

**Table 2**  
**Mode of Transportation**

<b>(NAICS 2022)</b>	<b>Weights</b>
	percent
NAICS 481: Air transportation	8
NAICS 482: Rail transportation	14
NAICS 483: Water transportation	4
NAICS 484: Truck transportation	61
NAICS 492: Couriers and messengers	12

Source: Statistics Canada.

The weights for the SCSPI are price updated which allows the index to be chained, as well as to be calculated between month  $t$  and  $t-1$  without referring to the base period  $t^0$ . Price updated weights,  $w_i^t$ , can be obtained by multiplying the initial revenue weights by price relatives, using the following formula:

$$w_i^t = \frac{EA_i^{t-1} w_i^{t-1}}{\sum \left( EA_i^{t-1} w_i^{t-1} \right)}$$

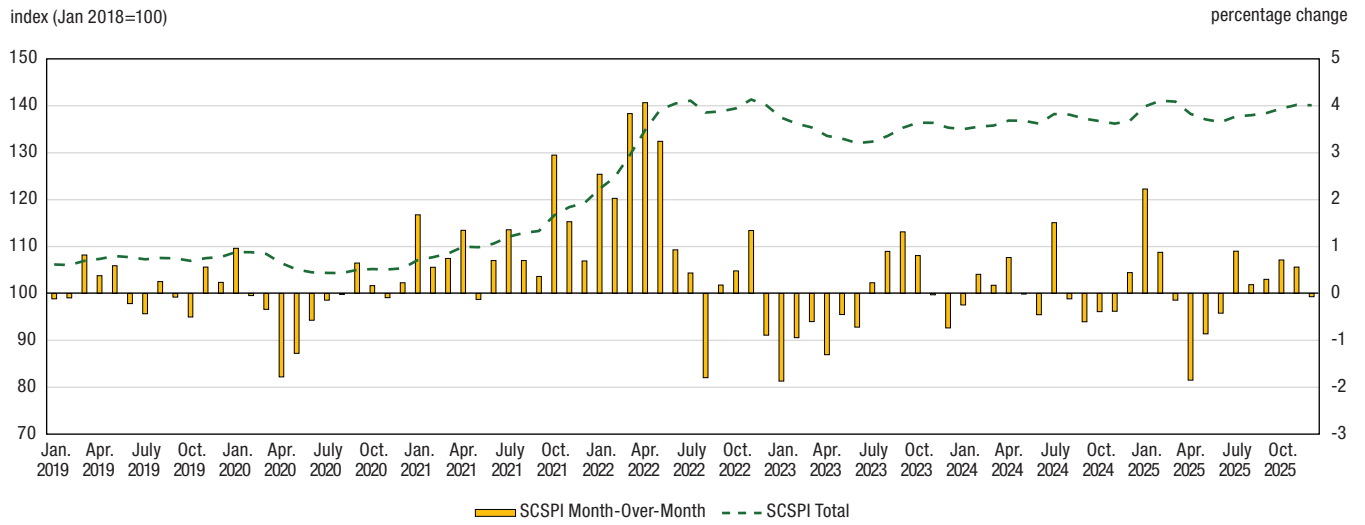
$EA_i^t$ : The elementary aggregate for subsector  $i$  at time  $t$

$w_i^t$ : Weight of subsector  $i$  at time  $t$

## Results and Analysis

Overall, SCSPI was stable throughout 2019 until March 2020, which was then followed by many sequential monthly decreases. Subsequently, the SCPI started a continued growth pattern from January 2021 until July 2022. This was followed by decreases until June 2023, from which it stabilized until 2025. The largest monthly movements were from increases in March through May 2022, increasing between 3.2% and 3.8%. Alternatively, the largest decrease was in May 2025 at -2.0%. SCSPI can be impacted by fuel prices, as many components of the index include fuel surcharges (adjusted with fuel prices).

**Chart 3**  
**SCSPI Total and SCSPI month-over-month percentage change**



Source: Statistics Canada Supply Chain Services Price Index (Appendix A).

## Appendix A

**Table A.1**  
**TSI and SCSPI Data Table**

Reference Period	TSI Unadjusted	TSI Seasonally Adjusted	SCSPI
	(jan 2018=100)	percentage change	(jan 2018=100)
<b>2018</b>			
January	100.0	99.9	100.0
February	97.5	100.8	100.7
March	99.3	99.9	101.3
April	96.5	98.5	102.0
May	96.4	97.9	103.0
June	95.8	98.4	104.8
July	95.7	98.0	105.2
August	96.0	97.9	105.2
September	96.2	98.5	105.4
October	98.3	98.8	106.0
November	98.5	99.0	106.3
December	99.0	98.9	106.3
<b>2019</b>			
January	100.2	99.7	106.2
February	96.2	99.6	106.1
March	100.1	100.4	106.9
April	100.1	102.2	107.3
May	101.5	103.2	108.0
June	100.4	103.2	107.7
July	100.8	103.1	107.3
August	101.2	103.8	107.6
September	99.4	102.0	107.5
October	101.1	101.2	106.9
November	100.1	100.7	107.5
December	102.5	102.1	107.8
<b>2020</b>			
January	101.2	100.6	108.8
February	99.2	100.5	108.8
March	93.8	93.8	108.4
April	78.0	79.2	106.5
May	79.7	81.5	105.1
June	86.9	90.0	104.5
July	89.0	91.1	104.4
August	88.1	90.8	104.3
September	91.3	93.2	105.0
October	95.7	96.3	105.2
November	97.1	97.7	105.1
December	99.0	98.1	105.3
<b>2021</b>			
January	99.1	98.8	107.1
February	94.7	97.9	107.7
March	99.3	99.1	108.5
April	97.3	99.0	110.0
May	95.7	98.1	109.8
June	95.3	98.2	110.6
July	95.5	98.3	112.1
August	98.1	100.7	112.9
September	100.4	102.8	113.3
October	103.1	103.5	116.6
November	103.8	104.5	118.4
December	105.1	104.4	119.3
<b>2022</b>			
January	104.2	104.2	122.3
February	101.9	105.1	124.8
March	105.2	104.6	129.6
April	103.0	104.7	134.8
May	102.3	104.5	139.2
June	100.7	104.0	140.5

**Table A.1**  
**TSI and SCSPi Data Table**

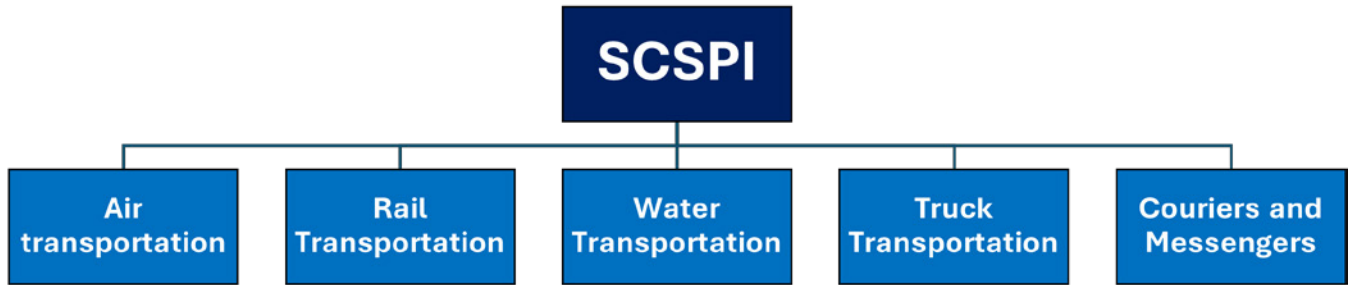
Reference Period	TSI Unadjusted	TSI Seasonally Adjusted	SCSPi
	(jan 2018=100)	percentage change	(jan 2018=100)
July	100.8	103.4	141.1
August	100.9	103.4	138.6
September	100.2	102.9	138.8
October	102.3	103.0	139.5
November	102.0	102.1	141.4
December	100.9	100.8	140.1
<b>2023</b>			
January	103.9	103.6	137.5
February	101.3	104.3	136.2
March	105.4	104.8	135.4
April	102.7	104.2	133.6
May	102.1	104.2	133.0
June	100.6	104.1	132.1
July	101.8	104.8	132.4
August	102.8	105.1	133.5
September	102.3	105.3	135.3
October	103.7	104.3	136.4
November	105.5	106.0	136.3
December	105.6	105.5	135.3
<b>2024</b>			
January	106.4	105.8	135.0
February	105.6	106.3	135.6
March	106.4	105.9	135.8
April	105.3	107.2	136.8
May	104.5	106.5	136.8
June	103.7	107.4	136.2
July	105.0	107.4	138.3
August	103.6	106.3	138.1
September	103.3	106.4	137.3
October	106.2	106.4	136.7
November	105.4	106.3	136.2
December	107.8	107.7	136.8
<b>2025</b>			
January	108.6	107.6	139.9
February	104.1	107.0	141.1
March	107.9	107.6	140.9
April	104.7	106.4	138.3
May	103.8	107.1	137.1
June	102.3	106.8	136.5
July	104.1	107.0	137.8
August	102.6	106.6	138.0
September	103.5	107.5	138.4
October	106.3	107.8	139.4
November	107.0	108.2	140.2
December	110.2	109.0	140.1

Source: Statistics Canada Supply Chain Services Price Index.

## Appendix B

**Figure 1** presents the aggregation structure from the lowest level of aggregation called elementary aggregates at the subsector level up to the total SCSPI. Subsectors included are Air Transportation, Rail Transportation, Water Transportation, Truck Transportation and Couriers and Messengers.

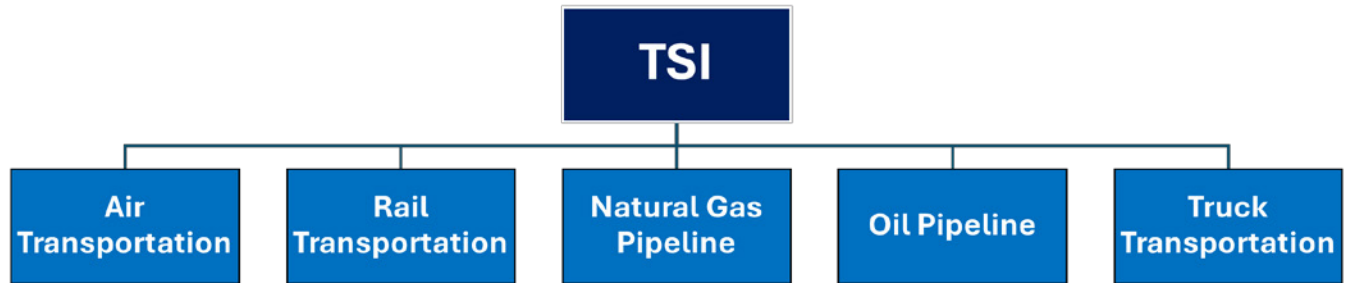
**Figure 1**  
**Aggregation structure for Supply Chain Services Price Index**



Source: Statistics Canada.

**Figure 2** presents the aggregation structure from the lowest level of aggregation called Volume Index at the subsector level up to the total TSI. Included subsectors are Air transportation, Rail Transportation, Natural Gas Pipeline, Oil Pipeline and Truck transportation.

**Figure 2**  
**Aggregation structure for Transportation Services Index**



Source: Statistics Canada.