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ANALYSIS OF THE AIR NAVIGATION SERVICE CHARGING SYSTEM IN THE USA AND CANADA

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Abstract

This paper deals with analysis of the air navigation service charging system in the USA and Canada. General information about air navigation service providers is explained here. In the paper are described FAA ATO´s and NAV CANADA´s history, organizational structure, financing and air navigation service charges. And there are practical calculations of charges collected in the USA and Canada.

Keywords

USA, CANADA, Air navigation services, Air navigation service providers, Air navigation charges, FAA, NAV Canada

1. INTRODUCTION

Air navigation service providers (ANSPs) are infrastructural enterprises. As stated by IATA (2022) ANSPs ensure safe and efficient movement of the aircraft within airspace under their control. Each state has its own ANSP that provides air navigation services (ANS) in their airspace. The ownership of these infrastructural enterprises may be in public ownership, where they are organized as part of the state apparatus such as the Air Traffic Services of the Slovak Republic. Some ANSPs are partially privatized but at present it is rather an exception such as British NATS or the Swiss Skyguide.

Main product of ANSPs is providing ANS. Providing ANS is comprehensive set of activities and services that are an essential aspect of maintaining and maximizing the flow and safety of air transport.

The Chicago Convention from 1944 also known as the Convention on international Civil Aviation set out the basic principles of international air transport. And it also affected the charging of air navigation services.

ICAO in its document ICAO's Policies and Charges for Airports and Air Navigation Services (Doc 9082/9) issued recommendations to the States that should ensure that ANS charging works on the basis of these basic principles stated in this document.

2. PROVIDING AIR NAVIGATION SERVICES IN THE USA

Air Traffic Organization (ATO)

In the USA air navigation services are provided by the Federal Aviation Administration (FAA). Specifically the Air Traffic Organization (ATO) which is a part of the FAA's organizational structure. Organizational structure consist of five operational segments. They are responsible for airports, provision of air navigation services, air safety, space activities and hazardous materials (Figure 1).

Figure 1: Organizational structure of the FAA. Author by: (FAA 2022a).

The ATO provides ANS to users of the airspace of the USA. The airspace size is 29,4 milion square miles. It is more than 17% of the world's airspace. Airspace of the USA includes all of the USA and big part of Pacific and Atlantic Oceans and also includes the Gulf of Mexico. The ATO operates more than 50 000 commercial, private and military flights that pass through US aisprace daily. This is provided by ATO staff of more than 35 000 and includes air traffic controllers, technicians, engineers and support staff (FAA 2022b).

History of the ATO

Since 1958, the FAA has been responsible for ensuring the safe operation of the world's busiest and most complicated air transport system. The FAA oversees all aspects of civil aviation in the USA, including the operation of the air traffic control system and safety regulation. The FAA underwent several reorganizations, the main one in terms of providing air navigation services was in 2000. At that time, President Clinton ordered the establishment of the ATO, which began operations in 2004 (Enotrans 2016).

Organizational structure of the ATO

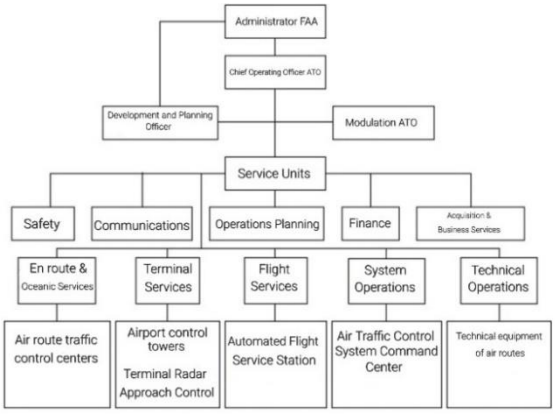


Figure 2: Organization structure of the FAA ATO. Author by: Tomová, Marerna, Lokaj (2017).

The FAA ATO's organizational structure (Figure 2) has five main organizational units:

- Flight Services – provided by an Automated Air Services Station,
- Terminal Services – provided by Airport control towers and Terminal Radar Approach Control,
- En route & Oceanic Services – provided by Air route traffic control centers,
- System Operations – provided by Air Traffic Control System Command Centre,
- Technical Operations – provided by a Technical equipment of air routes.

There are five other units in the highest part of the organizational structure :

- Safety,
- Communications,
- Operations Planning,
- Finance,
- Acquisition & Business Services.

3. CHARGES FOR THE PROVISION OF AIR NAVIGATION SERVICES IN THE USA

In the USA the FAA does not charge fees for the use of federal navigational facilities ot telecommunications services. This definiton is given in the FAA's Aeronautical Information Publication (AIP) (FAA, 2022c). Thus, how the funding system of the FAA ATO works, and where it generates its resources, needs to be discussed in more detailed overview of the FAA overall funding.

According to the FAA (2022d), the FAA is funded from two sources:

- General budget,
- Airport and Airway Trust Fund (AATF).

Airport and Airway Trust Fund (AATF)

The Airport and Airway Revenue Act of 1970 created AATF to provide funding for the aviation system of the USA. This fund is indepedent of the general fund. Revenues to the AATF come from excise taxes on passengers, cargo and fuel collected by air transport. The AATF provides funding to improve airports and air routes in the USA. FAA is mostly funded by AATF, in 2021 it was 95% from the whole budget of the FAA.

To collect aviation excise taxes and to spend finances from the AATF the FAA needs an authorization and it must be reauthorized periodically. The last Reauthorization Act was enacted on October 5, 2018 (FAA, 2020).

Financial resources of the AATF

AATF receives revenue mainly from the various excise taxes paid by the USA airspace users. Excise taxes come from plane tickets, certain domestic flights (between the USA and Alaska/Hawaii or between Alaska an Hawaii), international arrivals and departures, purchases of aviation fuel and much more. Summary of the excise taxes is given in following table.

Table 1: Structure of excise taxes, resources for AATF. Author by FAA (2022e).

Aviation taxes	Comment	Tax Rate
Passengers		
Domestic Passenger – Ticket tax	Ad valorem tax	7,5% of ticket price
Domestic flight		$ 4,30 per passenger
Passenger Ticket Tax for Rural Airports	Flights that begin/end at a rural airport	7,5% of ticket price
International Arrival & Departure Tax		$ 18,90
Flights between continental U.S. and Alaska or Hawaii		$ 9,50 international facilities tax + applicable domestic tax rate
Frequent Flyer Tax	Ad valorem assessed on mileage awards	7,5% of value of miles
Freight/Mail		
Domestic Cargo/Mail		6,25% of amount paid for the transportation of property by air
Aviation Fuel		
General Aviation Fuel Tax		Aviation gasoline: $0,193/gallon Jet fuel: $0,218/gallon

Commercial Fuel Tax		$ 0,043/gallon

Charges for flights through US controlled airspace

Direct user fees are charged only for flights through airspace of the USA. Airspace of the USA is divided into oceanic and enroute airspace (Figure 4).

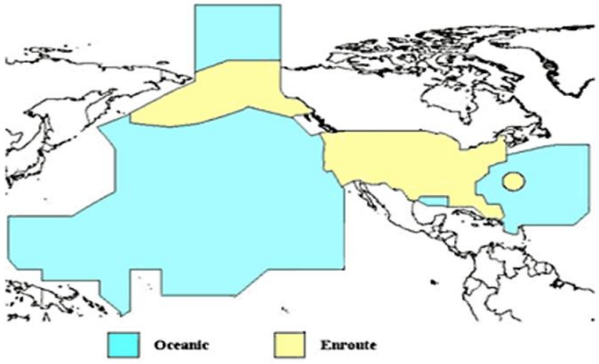


Figure 3: Airspace of the USA divided into Oceanic and Enroute. FAA(2022e)

Table 2: Overflight charge rates in the USA. Author byFAA (2022f).

Effective Date	Enroute rate	Oceanic rate
January 1, 2019	$ 61,75	$ 26,51

These rates are expressed per 100 nautical miles, taking into account the distance of the great circle from the point of entry to the point of exit from airspace of the USA.

Calculation of the enroute and oceanic charges

Formula for calculation of the enroute charge:

$$Enroute\ charge = Enroute\ rate\ x\ \frac{Enroute\ flown\ distance}{100}$$

Formula for calculation of the oceanic charge:

$$Oceanic\ charge = Oceanic\ rate\ x\ \frac{Oceanic\ flown\ distance}{100}$$

Formula for calculation of overall charge:

$$Overall\ charge = ER\ x\ \frac{EFD}{100} + OR\ x \frac{OFD}{100}$$

- Overall charge – charged per aircraft between inbound and outbound point of the airspace of the USA,
- ER – Enroute rate,
- EFD – Enroute flown distance,
- OR – Oceanic rate,
- OFD – Oceanic flown distance.

4. CHARGES FOR THE PROVISION OF THE AIR NAVIGATION SERVICES IN CANADA

Air navigation service provider in Canada is NAV Canada. NAV Canada provides air navigation services for the users of airspace under Canadian control. Airspace of Canada is more than 18 million square kilometers big and includes North Atlantic airspace controlled by NAV Canada.

Nav Canada is geographical monopoly and is one of few private entities in the world that is fully responsible for the provision of the ANS. It has more than 4000 employees (NAV Canada 2022a).

According to Tomova and Havel (2005) NAV Canada is non-profit organization providing ANS. In such a company the profit generated by the provider's activity can only be used for the development of the provider itself.

History of NAV Canada

History of the NAV Canada began on November 1, 1996. On that date the air navigation services were purchased from the Canadian Department of Transportation for CAD 1,5 bilion. John Crichton founding chairman and CEO of NAV Canada from 1997 to 2015 wanted to make significant development in the company. He asked for help from employees with their experiences form segment in order to make NAV Canada world's most respected ANSP. In the following years the vision of the company's founder became a reality and NAV Canada began to achieve success (NAV Canada 2021b).

Organizational structure of the NAV Canada

NAV Canada has no shareholders. The company is managed by a board of directors with 15 members. These members represents 4 stakeholder groups that established NAV Canada – the Canadian government, commercial air carriers, the commercial and general aviation sector and the employee unions. This combination ensures that all points of view are represented at the table and all groups has the same rights. A committee with 20 aviation experts is also used to give recommendations to key issues.

Table 3: Number of voted members by stakeholders. Author by NAV Canada (2021a).

Stakeholder	**Number of members**
Canadian government	3
Commercial air carriers	4
The commercial and general aviation sector	1
Employee unions	2

So the first 10 members of the Board of Directors are selected as stated in table. Next these 10 members elects next four members who cannot have any ties to these groups. And these

14 members elects President and Chief Executive Officer, who become the 15th member of the Board of Directors.

Board members cannot be active employees or members of airlines, unions or governments. And atleast two-thirds of the board members including President must be Canadian citizens.

FINANCING NAV Canada

Nav Canada receives its revenues in the form of direct fees paid by aircraft operators for the provision of ANS.

According to NAV Canada (2020), the charging system is divided into three main categories for terminal and enroute services:

- Charges for propeller aircraft (including helicopters) weighing three metric tonnes or less,
- Daily charges for propeller aircraft over three metric tonnes and small jet aircraft,
- Movement-based charges for propeller aircraft over three metric tonnes and jet aircraft.

In additions, there are movement-based charges for oceanic services.

Charges for propeller aircraft (including helicopters) weighing three metric tonnes or less

Table 4: Quarterly charges for foreign-registered propeller aircraft (including helicopters). Author by NAV Canada (2020).

MTOW (metric tonnes)	Base Rates Effective March 1, 2022
0,617 to 2,0	$ 87,69
Over 2,0 to 3,0	$ 292,88

Table 5: Quarterly charges for foreign-registered propeller aircraft (including helicopters). Source: Author by NAV Canada (2020).

MTOW (metric tonnes)	Base Rates Effective March 1, 2022
0,617 to 2,0	$ 21,92
Over 2,0 to 3,0	$ 73,22

Table 6: Daily charges on certain international airports. Author by NAV Canada (2020).

Base rate Effective March 1, 2022	Annual maximum
$ 12,91	120 cherges per year per aircraft

Daily charges for propeller aircraft (including helicopters) over three metric tonnes and small jet aircraft

Table 7: Daily charges for propeller aircraft (including helicopters). Author by NAV Canada (2020).

MTOW (metric tonnes)	Base Rates Effective September 1, 2020
Over 3.0 to 5.0	$ 54,19
Over 5.0 to 6.2	$ 108,40
Over 6,2 to 8,6	$ 429,72
Over 8,6 to 12,3	$ 997,52
Over 12,3 to 15,0	$ 1486,59
Over 15,0 to 18,0	$ 1785,97
Over 18,0 to 21,4	$ 2407,98
Over 21,4	$ 3124,17
Maximum Daily Charge for Helicopters	$ 108,40

Table 8: Daily charges for small jet aircraft. Author by NAV Canada (2020).

MTOW (metric tonnes)	Base Rates Effective September 1, 2020
0,617 to 3,0	$ 205,19
Over 3,0 to 6,2	$ 264,55
Over 6,2 to 7,5	$ 429,72

Movement based charges for propeller aircraft over three metric tonnes and jet aircraft

Enroute Charges

Enroute charges are applied to air navigation services provided in an airspace controlled by Canada, with exception of the Gander Ocean Area. Divided Canadian airspace is shown on the figure below.

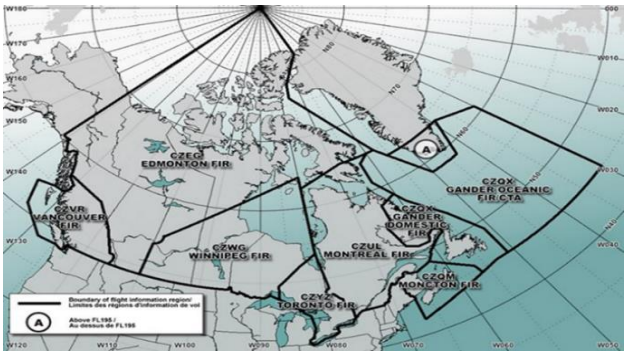


Figure 4: Divided Canadian controlled airspace. Canada (2022).

The enroute charge applies to overflights and flights that land or take-off in Canada. In the case of landing or take-off in Canada the charges apply to:

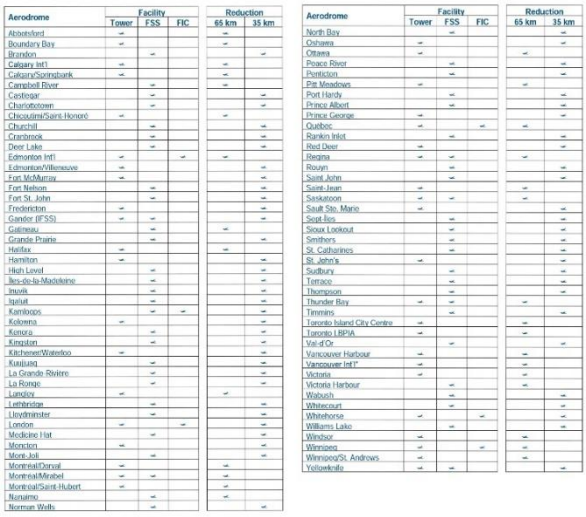
- Flights between two Canadian airports , where at least one is located at or below 60° North latitude, and at least one of which is aerodrome where NAV Canada applies the Terminal Service charge,
- To flights between two Canadian airports that are located north of 60° North latitude, and at least one of which is an airport where NAV Canada applies the Terminal Service charge,
- To international flights.

The charge takes into account the distance flown and, less than proportionately, the aircraft weight. The charge is applied on a per flight basis and is equal to the product of unit rate (R), the weight factor (W) and the distance (D). The calculation of terminal charge is described below:

$$charge = R\ x\ W\ x\ D$$

- The unit rate (R) is $ 0,03802 (Effective September 1, 2020)
- The weight factor is obtained: √MTOW
- The distance (D) is equal to the distance of the great circle in Canadian airspace, excluding Gander Ocean airspace, in the case of overflights and international flights landing or taking off in Canada

The distance (D) may be adjusted by 35 km or 65km (deducted) if the airport is listed in the following tables. If an aircraft takes off and lands at the airport, where the distance is adjusted, this value shall be deducted on departure and arrival.



Aerodrome	Facility			Reduction	
	Tower	FSS	FIC	65 km	35 km
Abbotsford	✓			✓	
Boundary Bay	✓			✓	
Brandon		✓			✓
Calgary Int'l	✓			✓	
Calgary/Springbank	✓			✓	
Campbell River		✓		✓	
Castlegar		✓			✓
Charlottetown		✓			✓
Chicoutimi/Saint-Honoré	✓			✓	
Churchill		✓			✓
Cranbrook		✓			✓
Deer Lake		✓			✓
Edmonton Int'l	✓		✓	✓	
Edmonton/Villeneuve	✓				✓
Fort McMurray	✓				✓
Fort Nelson		✓			✓
Fort St. John		✓			✓
Fredericton	✓				✓
Gander (FSS)	✓	✓			✓
Gatineau		✓		✓	
Grande Prairie		✓			✓
Halifax	✓			✓	
Hamilton	✓				✓
High Level		✓			✓
Îles-de-la-Madeleine		✓			✓
Inuvik		✓			✓
Iqaluit		✓			✓
Kamloops		✓	✓		✓
Kelowna	✓				✓
Kenora		✓			✓
Kingston		✓			✓
Kitchener/Waterloo	✓				✓
Kuujjuaq		✓			✓
La Grande Rivière		✓			✓
La Ronge		✓			✓
Lansdowne	✓			✓	
Lethbridge		✓			✓
Lloydminster		✓			✓
London	✓		✓		✓
Medicine Hat		✓			✓
Moncton	✓				✓
Mont-Joli		✓			✓
Montréal/Dorval	✓			✓	
Montréal/Mirabel	✓	✓			✓
Montréal/Saint-Hubert	✓			✓	
Nanaimo		✓		✓	
Norman Wells		✓			✓

Aerodrome	Facility			Reduction	
	Tower	FSS	FIC	65 km	35 km
North Bay	✓				✓
Oshawa	✓				✓
Ottawa	✓			✓	
Peace River		✓			✓
Penticton		✓			✓
Pitt Meadows	✓			✓	
Port Hardy		✓			✓
Prince Albert		✓			✓
Prince George	✓				✓
Québec	✓		✓	✓	
Rankin Inlet		✓			✓
Red Deer	✓				✓
Regina	✓	✓		✓	
Rouyn		✓			✓
Saint John		✓			✓
Saint-Jean	✓			✓	
Saskatoon	✓	✓		✓	
Sault Ste. Marie	✓				✓
Sept-Îles		✓			✓
Sioux Lookout		✓			✓
Smithers		✓			✓
St. Catharines		✓			✓
St. John's	✓				✓
Sudbury		✓			✓
Terrace		✓			✓
Thompson		✓			✓
Thunder Bay	✓	✓		✓	
Timmins		✓			✓
Toronto Island City Centre	✓			✓	
Toronto LBPIA	✓			✓	
Val-d'Or		✓			✓
Vancouver Harbour	✓			✓	
Vancouver Int'l*	✓			✓	
Victoria	✓			✓	
Victoria Harbour		✓		✓	
Wabush		✓			✓
Whitecourt		✓			✓
Whitehorse	✓		✓		✓
Williams Lake		✓			✓
Windsor	✓			✓	
Winnipeg	✓		✓	✓	
Winnipeg/St. Andrews	✓			✓	
Yellowknife	✓	✓			✓

Figure 5: List of airports in Canada with distance adjustment. NAV Canada (2020).

Terminal Charges

The terminal charges takes into account, less than proportionately, the aircraft weight. The charge is applied on departures only on a per flight basis and is equal to the product of the unit rate (R) and the weight factor (W). The calculation of terminal charge is described below:

$$charge = R\ x\ W$$

- The unit rate (R) is $ 31,86 (Effective September 1, 2020),
- The weight factor (W) is obtained: $(MTOW)^{0,8.}$

Oceanic Charges

Oceanic charges are divided into two types:

- Charge for providing ANS in North Atlantic (NAT) – charge for providing ANS in the Gander Ocean area,
- International Communications Service Charge (Int'l Comm) – applies to air-to-ground radio communications provided to an aircraft during an international flight other than between Canada and USA.

Oceanic charges are based on a flat fee for one flight.

Table 9: Oceanic charges. Source: Author by NAV Canada (2020).

	Base Rates **Effective September 1, 2020**
NAT	$ 230,22
Int'l Comm	
Position reporting using voice	$ 74,93
Position reporting using data link	$ 28,19

5. DIRECT COMPARSION OF AIR NAVIGATION SERVICE CHARGING SYSTEMS IN THE USA AND CANADA

Table 10: Basic characteristics ANSP in the USA and Canada. Author.

	USA	**Canada**
ANSP	ATO	NAV Canada
Ownership	Public	Public
Organizational structure	Part of the state apparatus	Non profit organization
Year of origin	2004	1996
Regulator	FAA	Transport Canada

Financing	Excise taxes and appropriations	Direct charges for providing ANS

There are differences in ownership but also in funding between ANSPs in the USA and Canada. FAA is publicly owned entity and directly depends on budgets and excise taxes, as well as government decisions. In contrast, NAV Canada is non-profit entity and its funding depends on direct fees from Canadian airspace users for providing ANS. NAV Canada can take financial decisions separately from its government. But must use the profits generated by the ANSP only for its own development and is therefore reinvested within undertaking.

The air navigation charging systems in the USA and Canda have significant differences so charges in the USA and Canada are directly compared on practical examples below.

6. PRACTICAL EXAMPLES OF CALCULATIONS

Charge for overflight of Canadian controlled airspace

The Boeing 747-400 flies from Seattle (KSEA) to London (EGLL). MTOW is 395 metric tonnes and distance flown is 3787 kilometers.

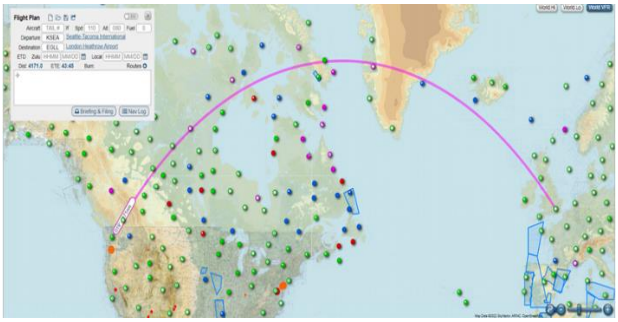


Figure 6: Illustration of the flight from KSEA to EGLL. Skyvector (2022[a]).

Calculation:

The first step is to calculate the oceanic charges. Aircraft position reporting is provided by a data link, where the rate is $ 28,19 per flight. The oceanic charge is:

$$Oceanic\ charge = \$\ \mathbf{28,19}$$

For calculation of enroute charge is used formula:

$$Enroute\ charge = R\ x\ W\ x\ D$$

The weight factor (W) = √MTOW=√395=19,87

The unit rate (R) = $ 0,03802

$$Enroute\ charge = 0{,}03802\ x\ 19{,}87\ x\ 3787$$

$$Enroute\ charge = \$\ \mathbf{2860,92}$$

As the terminal charge does not apply to this flight, amount ANS provided (KSEA-EGLL) was calculated as:

$$Total\ charge = Oceanic\ charge + Enroute\ charge$$

$$Total\ charge = 28{,}19 + 2860{,}92$$

$$Total\ charge = \$\mathbf{2889,11}$$

Charge for overflight of controlled airspace by the USA

In the case of the USA, formula for calculating the amount of charges for flying through US airspace is completely different. Oceanic charges are collected otherwise, therefore the length of the oceanic flown distance will be adjusted to reflect the oceanic charge in Canada ($ 28,19). And enroute flown distance will be the same as when flying through the airspace of Canada (3787 kilometers).

Table 11: Example for calculation overflight fees in airspace controlled by the USA. Author.

Enroute flown distance	2353,1385536928 nautical miles (3787 km)
Oceanic flown distance	106,35 nautical miles ($28,19)
Enroute rate	$ 61,75
Oceanic rate	$ 26,51

In direct comparison of the charges in airspace of the USA and Canada, where the same distances were used and the same oceanic charge, there is a significant difference in the amount of charges. It is due to different formulas used for calculations in these countries. So even if the length of the flights and oceanic charge are the same, the values of the Overall charges are very different.

Charge for a domestic flight in the USA

The formulas cannot be used to calculate the domestic charge in the USA, as the FAA does not directly charge for air navigation services. But it is possible to calculate the amount of excise taxes that will be collected for certain flight.

Flight from San Francisco (KSFO) to San Diego (KSAN) with Boeing 737-400. Distance flown is 624 kilometers. Number of passengers is 145. Price for the plane ticket was uniform $50. And the aircraft used 1100 gallons of fuel.

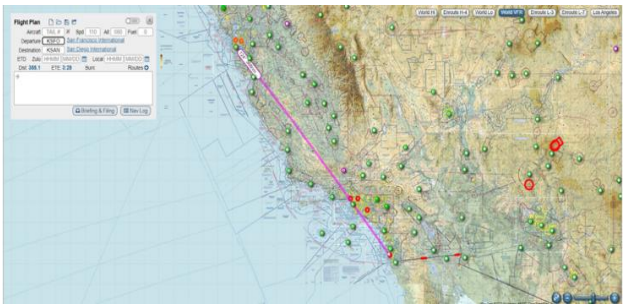


Figure 7: Illustration of flight from KSFO to KSAN. Skyvector (2022[b]).

By the Figure 3 we can make a calculations of:

Domestic passenger ticket tax

If the price of the ticket was $50 then 7,5% of one ticket is $3,75. The number of tickets was 145, so the total value is **$543,75**.

Domestic flight tax

Unit rate is $4,30 per passenger, on board there was 145 passengers. Total value is **$ 623,50**.

Commercial fuel tax

Unit rate for commercial fuel tax is $0,043/gallon. During the flight was used 1100 gallons of fuel. Total value is **$47,30**.

Total value of all taxes collected on this flight is **$1214,55.** That amount will be credited to AATF.

Charge for a domestic flight in the Canada

For better comparison with the charge for domestic flight in the USA a shorter domestic flight in Canada was picked.

Flight from Calgary (CYYC) to Vancouver (CYVR) where the distance flown is 598 kilometers. And the aircraft is Boeing 737-400 with MTOW of 70 metric tonnes.

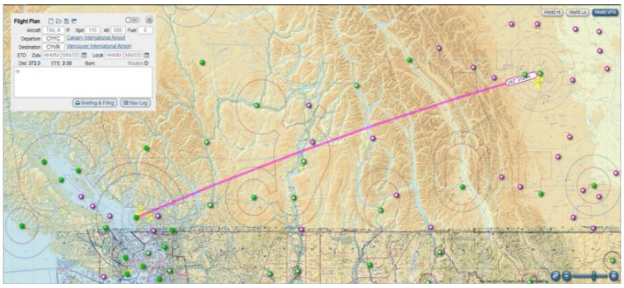


Figure 8: Illustration of flight from CYYC to CYVR. Source: Skyvector (2022[c]).

Oceanic charge is not applicable on this flight.

Calculation of enroute charge is:

$$Enroute\ charge = R\ x\ W\ x\ D$$

The weight factor (W) $\sqrt{MTOW} = \sqrt{70} = 8{,}36660$

The unit rate (R) = $ 0,03802

$$Enroute\ charge = 0{,}03802\ x\ 8{,}36660\ x\ (598 - 65 - 65)$$

$$Enroute\ charge = \$\ 148{,}87$$

Terminal charge calculation (Calgary and Vancouver):

The weight factor (W)= $MTOW^{0,8} = 29{,}92805$

The unit rate (R) = $ 31,86

Terminal charge=31,86 x 29,92805

Terminal charge=$ 953,51

Total charge for ANS (CYYC – CYVR) is $ 1102,38.

SUMMARY OF CALCULATED VALUES FOR DOMESTIC FLIGHTS IN THE USA AND CANDA

Table 13: Overview of calculated values for domestic flight in the USA. Author.

Domestic passenger ticket tax	$ 543,75
Domestic flight tax	$ 623,50
Commercial fuel tax	$47,30
Total tax	**$ 1214,55**

Due to lack of direct navigation charges in the USA, the amounts of excise taxes for flight between KSFO and KSAN were calculated from the determined values. The total amount of excise taxes collected from this flight was $1241,55 and this amount is credited to the AATF.

Table 14: Overview of calculated values for domestic flight in Canada. Author.

Enroute charge	$ 148,87
Terminal charge	$ 953,51
Total charge	**$ 1102,38**

In Canada, the provision of air navigation services on domestic flights is subject to direct user charges. According to formulas, the enroute charge and terminal charge were calculated and total value of charge is $1102,38.

7. CONCLUSION

The paper was aimed to find out how air navigation service charging systems work in the USA and Canada, and then compare them with an analysis, and highlight differences. Significant differences were found in ownership and funding between ANSPs in the USA and Canada.

The FAA is part of the state apparatus and depends on excise taxes and budgetary resources, and government decisions. Charges for providing ANS are not divided into terminal and enroute. Direct user fees are charged only for the flights through US controlled airspace. The FAA is mainly funded by the AATF, and AATF is generated by revenue from excise taxes.

NAV Canada as a non-profit entity is not depended on financing from budgetary resources. Its revenues consist of direct user charges to users of Canadian-controlled airspace for providing ANS. However, NAV Canada, as a non-profit entity must use the profits generated by itself only for its own development.

In the practical examples of calculations were compared overflights through the airspace of the USA and Canada, where significantly different values were calculated. Then there were compared also domestic flights in the USA and Canada. Domestic flights had very similar entry values but since the FAA ATO does not charge direct user charges on domestic flights, the comparison was more demanding, but the resulting charges were similar, although the calculations methods were completely different.

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