AERONAUTICAL STUDY

Toronto Buttonville Review of Air Traffic and Aviation Weather Services

NAV CANADA
Navigation & Airspace
Level of Service
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Aeronautical Study – Review of Air Traffic and Aviation Weather Sercices Toronto-Buttonville, ON (CYKZ)

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Executive Summary

The purpose of this Aeronautical Study is to examine the proposal to close the Toronto-Buttonville air traffic control tower as well as review the requirements for aviation weather services at the airport.

The Toronto Buttonville airport is located approximately 16NM north-east of Toronto Lester B. Pearson airport, 14NM north from the Toronto Billy Bishop City Airport and 21NM from the Oshawa Airport.

The Toronto Buttonville Air Traffic Control (ATC) tower provides a 16-hour per day Airport Control Service and Vehicle Control Service from 0700h to 2300h local time. When the tower is closed, pilots and vehicle operators communicate with each other on the Mandatory Frequency (MF). A Remote Communications Outlet (RCO) is located at the airport through which Flight Information Service Enroute (FISE) is provided by the London Flight Information Centre (FIC).

Aviation weather services include a Contract Weather Office (CWO) that provides 24-hour weather observations (METAR/SPECI) in support of a 24-hour aerodrome forecast (TAF). Outside tower hours weather information including wind and altimeter to conduct an instrument approach is available from Toronto Area Control Centre (ACC) or London FIC via the RCO. Due to its proximity to Toronto Lester B. Pearson (24-hour METAR and TAF), Billy Bishop City (24-hour METAR AUTO and 24-hour TAF) and Oshawa (24-hour METAR auto and weather cameras), the closure of the CWO would have minimal impact on aircraft operations at Toronto-Buttonville airport.

While the airport had been scheduled to close for redevelopment of the land for other uses, in April 2017, the Toronto-Buttonville airport operator announced it would continue airport operations until October 31, 2018 and possibly beyond that date should airport redevelopment dictate.

Nevertheless, activity at the airport has been declining. Toronto Airways, the primary flight training school at Buttonville up until December 2016, merged with the Canadian Flight Academy (based at the Oshawa airport) to become one of Canada's largest flight training schools. Toronto Airways moved its flight school operation to the Oshawa airport in December 2016. Following the move, aircraft movements at the Toronto-Buttonville airport have fallen. The total movements for 2016 were 34,623, both IFR and VFR. The projected traffic levels for 2017 by solely removing the Toronto Airways movements would be 20,428.

The Aeronautical Study supports the proposal to close the Toronto-Buttonville air traffic control tower and the CWO.

Aeronautical Study – Review of Air Traffic and Aviation Weather Sercices Toronto-Buttonville, ON (CYKZ)

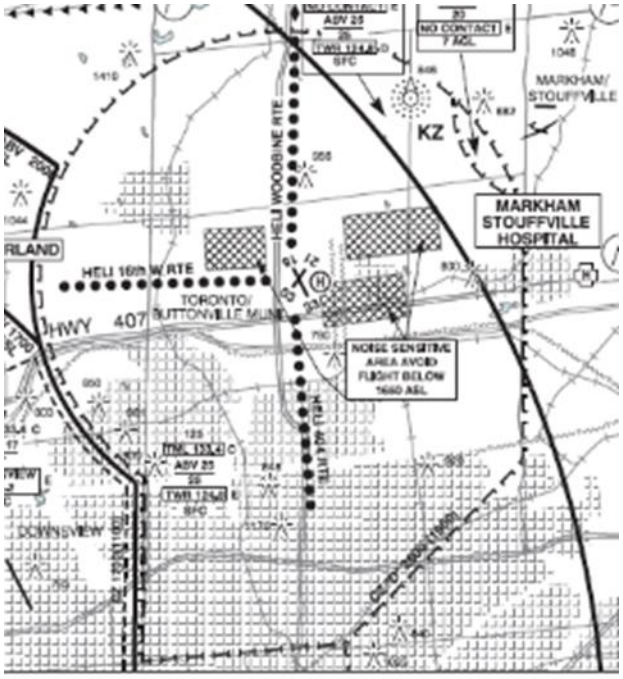
1.0 Purpose

This aeronautical study will examine the proposal to close the Toronto-Buttonville air traffic control tower as well as review the requirements for a Contract Weather Office (CWO) at the airport.

2.0 Background

The Toronto Buttonville airport is located approximately 16NM Northeast of Toronto Lester B. Pearson airport, 14NM north from the Toronto Billy Bishop City Airport and 21NM from the Oshawa Airport.

The Toronto Buttonville Air Traffic Control (ATC) tower provides a 16-hour per day Airport Control Service and Vehicle Control Service from 0700h to 2300h local time. When the tower is closed, pilots and vehicle operators communicate with each other on the Mandatory Frequency (MF). A Remote Communications Outlet (RCO) is located at the airport through which Flight Information Service Enroute (FISE) is provided by the London Flight Information Centre (FIC).



Aviation weather services include a Contract Weather Office (CWO) that provides 24-hour weather observations (METAR/SPECI) in support of a 24-hour aerodrome forecast (TAF). Outside tower hours weather information including wind and altimeter to conduct an instrument approach is available from Toronto Area Control Centre (ACC) or London FIC via the RCO.

Outside tower hours IFR clearances for departures are obtained from the Toronto ACC via telephone, through the London FIC by telephone or via the RCO.

The airport is surrounded by a class ‘D’ control zone from the surface to 2,500 feet above sea level with a 5 nautical mile radius (irregular shape). Surveillance coverage is available from approximately 300 feet Above Ground Level (AGL).

The airport has a number of noise restrictions and flights are prohibited outside of tower operation hours unless approved by airport property manager. Customs are available from 1200-0500Z for a maximum of 15 passengers. Fire and rescue services at the field are provided by the Markham Fire and Rescue stations 9-2 and 9-3.

The airport is operated by Torontair, which is owned Armadale Company Ltd.

There is no scheduled passenger service at the airport. It serves as a hub for local media (C172 and helicopters) and corporate General Aviation (GA) jets.

Toronto Airways, the primary flight training school at Buttonville, merged with the Canadian Flight Academy (based at the Oshawa airport) to become one of Canada's largest flight training schools. Toronto Airways moved its entire operation to the Oshawa airport in early December 2016, where it built a brand new flight training/dispatch facility. It will no longer conduct any flight training at the Buttonville airport.

In 2010, Armadale Properties, owned by the Sifton Family partnered with Cadillac Fairview, one of the largest and most respected land developers in Canada, to redevelop the airport property into a large and progressive mixed-use development project. Since the land requires rezoning, approval is currently with the Ontario Municipal Board. The airport was first slated for closure in the fall of 2016 but has been postponed tentatively to fall 2018.

3.0 Analysis

3.1 Methodology

The aeronautical study process conforms to the Canadian Standards Association's *CAN/CSA-Q850-97 Risk Management: Guideline for Decision Makers*.

A study team was formed, led by a Manager, Level of Service and Aeronautical Studies, to gather all relevant information, comments and concerns, related to proposal to close the Toronto-Buttonville Control Tower and the Contract Weather Office.

Individual and group meetings were held in Ottawa and in Toronto with regional customers and stakeholders to provide opportunity for both feedback and constructive discussion.

A HIRA was conducted to address all the safety and efficiency issues raised by customers and to develop mitigation, if required, to ensure they would not be materially impacted by the change. See the HIRA summary as Appendix 'C'.

3.2 Study Team

The study team comprised of the following:

	Title
Project Manager	National Manager, Level of Service
Team Leader	Manager, Level of Service and Aeronautical Studies
Contributors	Manager, Level of Service and Aeronautical Studies
	Site Manager, Toronto FIR
	Airport Operations Specialist, Toronto FIR

3.3 Consultation

Representatives from the NAV CANADA Level of Service Review Team met with customers, users and other stakeholders in a number of different forums: one on one in person meetings, group meetings, telephone and email. The purpose of these meetings was to obtain needs, issues and concerns with respect to the proposal to review the Air Traffic Control and the Aviation Weather Services. Consultations were done in the context of the overall Level of Service Review.

In general, customers and stakeholders expressed very few concerns regarding the proposal for service changes at Toronto-Buttonville Airport. A list of stakeholders and customers consulted is included in Appendix B. A summary of the main issues raised during the consultations follows.

3.3.1 Issues

3.3.1.1 Pilots will not be able to obtain Special Visual Flight Rules (SVFR) authorization with the closure of the Buttonville Control Tower.

Requests for SVFR may still be made with London FIC via the RCO.

3.3.1.2 The 24-hour METAR and TAF are very important for flight planning purpose for both IFR and VFR aircraft and will not be available to arriving and departing aircraft with the closure of the Tower and CWO.

In the event of the tower and CWO closure, the Toronto Buttonville airport will still be served by Limited Weather Information System (LWIS) which is already on site. The FIC and the Toronto ACC would have 24-hour access to wind speed and direction, temperature, dew point, and altimeter setting and would relay this information via the RCO or Direct Controller Pilot

Communication (DCPC) respectively. In addition, a recommendation will be made to provide the Oshawa Airport (CYOO) with a 24-hour TAF where it could have more value and this information would also be available 24 hours via the RCO.

3.3.1.3 Runway lighting control during hours of darkness and/or reduced visibility will not be available.

Airfield lighting is an Airport Operator responsibility. NAV CANADA provides support only to the extent its on-site resources allow. There are a number of solutions that the Airport Operator may apply to this issue.

3.3.1.4 Loss of an on-site ATC presence will lead to increased IFR departure and arrival delays.

IFR approach clearances will continue being issued to pilots directly on the Toronto ACC frequency. Arrival reports can be made after landing, once the aircraft is down and clear, to the London FIC on the RCO frequency or by telephone. IFR departure clearances can be obtained from the London FIC via phone prior to departure, via the RCO frequency prior to departure or, if the weather permits, after the pilot departs VFR.

3.3.1.5 There would be no notification of deteriorating runway surface conditions or requirement for runway maintenance. Consequently, Runway Condition Reports (RCRs) could be inaccurate which may impact safety of aircraft operation.

RCRs include the time when the report was produced. If the runway conditions change and the airport operator does not update the RCR on their own initiative, then pilots would be required to assess the conditions based on the most recent RCR and the weather conditions that have prevailed since the RCR was produced. This scenario is commonplace throughout the ANS. Pilots assess the risks associated with the possibility of changing runway conditions and adjust their operations accordingly.

3.4 Risk Analysis

The HIRA summary at Appendix 'C' provides a complete analysis of the hazards and risks identified under the proposals. Following is a summary of the hazards and risks.

3.4.1 Hazards

3.4.1.1 There may be an increased risk of air-to-air, air-to-ground and ground-to-ground collisions with no ATC on site.

Regulations and procedures are provided to facilitate communication and co-ordination between pilots operating within MF areas and at uncontrolled aerodromes. Instead of directing their calls to the ground station (control tower), pilots will broadcast their position and intentions on the MF and co-ordinate their activities. The arrival and departure procedures for uncontrolled aerodromes result in a safe and orderly flow of traffic and have proven effective at these and higher traffic levels.

3.4.1.2 Vehicle operators will be required to monitor the MF when the tower is closed. The loss of vehicle control service and no on-site ATS presence for visual confirmation of aircraft or vehicles on the manoeuvring area may result in an increase in risk of runway incursions and aircraft-vehicle collisions.

Aerodrome Standards and Recommended Practices Manual (TP312) establishes the standards for operations at uncontrolled aerodromes. These standards state that radio equipped vehicles shall communicate on the MF. Vehicle operators will be monitoring and communicating on the MF. This allows pilots and vehicle operators to be aware of each other's intentions, which provides mitigation against a runway incursion when there is no on-site ATS presence and vehicle control service is not provided.

3.4.2 Risks

No risks were identified due to the fact that procedures currently used outside of the tower hours of operations would be in place 24 hours. The weather information: wind speed and direction, altimeter and temperature would be available 24 hours via the RCO from London FIC or the ACC. The local weather information is available to the Flight Service Specialists and to ACC controllers on the Integrated Information Display System (IIDS) which obtains data through Automatic Data Acquisition and Processing System (ADAPS) direct from Buttonville Limited Weather Information System (LWIS).

3.5 Mitigation

3.5.1 Service

In the event of the tower and CWO closure, the Toronto Buttonville airport will still be served by Limited Weather Information System (LWIS) which is already on site. The London FIC and Toronto ACC would have 24-hour access to wind speed and direction, temperature, dew point, and altimeter setting which could be relayed via the RCO from the FIC or DCPC from the ACC. This service is already provided outside of the control tower hours of operation and would not result in a increase in workload.

3.5.2 Technical

The arrival and departure procedures for uncontrolled aerodromes result in a safe and orderly flow of traffic and have proven effective at these and higher traffic levels. Procedures are already in place outside of the control tower operating hours and would remain the same 24 hours per day.

The Airport Operator will be provided with sufficient notice to enable aircraft radio control of aerodrome lighting (ARCAL) equipment or other suitable means of equipment to be obtained, installed and integrated into the lighting system. Some airport vehicles may also require a change to their radio configuration to provide the ability for communication on the MF. Amendments to the Airport Operations Manual (AOM) will be required. NAV CANADA will provide timely communication of these changes to the airport operator by letter.

An RCO is already on site and will remain on site to provide communication with the London FIC.

LWIS equipment is already on site and will remain on site to provide wind speed and direction, altimeter and temperature 24-hours per day. The limited weather information will be available via London FIC or Toronto ACC.

3.5.3 Human Factors

Communications procedures will be similar with the addition of vehicle communications on the MF rather than on a separate vehicle frequency. Without an on-site ATS presence, vehicle operators communicating on the same frequency as pilots helps maintain situational awareness with respect to surface operations, particularly during hours of darkness or under reduced visibility conditions.

Aircraft flying Northbound from the Toronto Billly Bishop airport (CYTZ) are currently switched about 5 miles prior to entering the Buttonville Control Zone. The majority of the aircraft follow a route up the Don Valley Parkway staying to the east side of the highway (southbound traffic usually stay to the west side). The CYTZ Control Zone stretches out to about 7 miles in this direction and it gives the aircraft 2 miles to switch to the Buttonville frequency before reaching the boundary. This practice will continue with the 24-hr MF and this will give pilots time to broadcast their intentions on the MF prior to entering the Buttonville uncontrolled airspace.

3.5.4 Communication

Publications including the Canada Flight Supplement CFS, Canada Air Pilot (CAP) will be amended to reflect the change in ATS service, class of airspace and weather information service. An Aeronautical Information Circular (AIC) and Notice will be published in advance of the change. The Notice will also be sent directly to the key operators via email.

The airport operator will be provided with sufficient notice in order to make the required changes to the AOM with respect to emergency response, airport lighting changes and the vehicle management plan.

The goal of the communications plan is to advise and keep all customers, users and stakeholders informed of pending changes and obtain feedback relative to the service change.

4.0 Conclusion

The proposed changes in ATS and aviation weather information services will not materially impact the safety and/or efficiency of aircraft operations. The appropriate level of service will be maintained for this site.

4.1 Recommendations

The aeronautical team recommends the following:

- Close the Air Traffic Control tower and replace it with an MF. The airspace which is currently class D during Tower operating hours would become class E.
- Close the 24-hour CWO and replace with a LWIS (already on site). The limited weather information, wind, altimeter, temperature and dew point will be provided via RCO from London FIC. There would no longer be a TAF.

4.1.1 Change Management Table

Present	Proposed System	Change
Air Traffic Control (ATC) Service Buttonville Control Tower operates 16-hour per day	Remove the ATC Service and replace it with a Mandatory Frequency (MF)	Pilots and vehicles operating will be required to communicate and coordinate directly with each other on the MF for situational awareness.
24-hour METAR and TAF	No onsite METAR or TAF LWIS only	Limited weather information system will provide wind speed and direction, altimeter and temperature 24-hours per day to pilots by the London FIC via RCO and the Toronto ACC via DCPC.
Buttonville control zone is Class D (required to establish communication with ATC prior to entering, IFR-IFR seperation provided, VFR traffic conflict resolution workload permitting) airspace during the Air Traffic Control tower hours of operation (16-hours per day) and Class E airspace outside of the hours of operation (IFR-IFR separation provided).	With the removal of the air traffic control service, the airspace that is currently the Buttonville control zone would become Class E airspace.	Procedures currently used outside of the control tower hours of operations when the airspace is class E would be in place 24-hours per day.

4.1.2 Communication

All regulatory requirements will be met with respect to the changes listed in this report including:

- Notification of all affected NAV CANADA departments (Operations, Engineering, Communications, Training and Aeronautical Information Services)
- Publication of an Aeronautical Information Circular a minimum of one publication cycle prior to implementation of the change
- Publication of a Notice in accordance with the *Civil Air Navigation Services Commercialization Act*
- Notification to the affected Airport Operator of any changes that may be required to the Airport Operations Manual and operation of airport lighting and vehicle management
- Aeronautical information publication changes will be co-ordinated with the change implementation date

5.0 Monitoring

The Level of Service and Aeronautical Studies Branch is responsible for monitoring the implementation and post implementation of approved recommendations to ensure that service changes are performing as expected and that no unforeseen risks or hazards are introduced. In the event of any discrepancy, appropriate corrective action will be identified and initiated. The following monitoring actions will take place:

1. AIS publication changes will be reviewed for accuracy;
2. ANS safety reporting will be monitored for events related to the service changes;
3. Occurrence reporting will be monitored for events related to the service changes;
4. Customer Service reports will be monitored for issues related to the service changes; and,
5. An initial and a follow-up post implementation assessment will be completed approximately 90 days and one year after the implementation of the recommendations. These reviews will assess the effectiveness of the service change in terms of aviation safety, customer service and NAV CANADA efficiency, and may include interviews with customers and other stakeholders as required.

Appendix A

AIRCRAFT MOVEMENT STATISTICS

Movement	TORONTO/BUTTONVILLE (TWR)							
	2016				2017			
	Locals	VFR	IFR	Total Monthly	Locals	VFR	IFR	Total Monthly
Jan	2,212	1,360	306	3,878	454	482	249	1,185
Feb	1,556	1,282	278	3,116	398	587	219	1,204
Mar	2,270	2,152	359	4,781	382	681	308	1,371
Apr	3,044	2,873	422	6,339	480	969	454	1,903
May	4,078	3,249	520	7,847	484	1,043	1,332	2,859
Jun	4,070	3,774	472	8,316	598	1,332	428	2,358
Jul	2,854	3,181	461	6,496	996	1,711	433	3,140
Aug	3,610	3,424	577	7,611	686	1,821	416	2,923
Sep	3,142	3,202	603	6,947	0	0	0	0
Oct	3,068	2,478	559	6,105	0	0	0	0
Nov	2,766	2,021	334	5,121	0	0	0	0
Dec	396	493	243	1,132	0	0	0	0
Local Month	33,066	29,489	5,134	67,689	4,478	8,626	3,839	16,943

Prepared by Operational Analysis [th]
From EXCDS data - May 2017

Appendix B

STAKEHOLDER LIST

Torontair (Million Air)
Flight Exec
York Regional Police Air Support Unit
Ornge
Leggat Aviation
NAV CANADA Weather Services
NAV CANADA Engineering
NAV CANADA Site Manager
Oshawa Airport
Canadian Flight Academy
Magna
Stronach Group
Buttonville Flying Club

Appendix C

HAZARD IDENTIFICATION AND RISK ASSESSMENT TABLE

HIRA Summary Table

Hazard/Issue	Existing Mitigation (defence) in the System	Risk Estimations	Risk Evaluation	Mitigation	Evaluation (of mitigation)
Hazard There may be an increased risk of air to air, air to ground and ground to ground collisions with no ATC on site.	Regulations and procedures are provided to facilitate communication and co-ordination between pilots operating within MF areas and at uncontrolled aerodromes. Instead of directing their calls to the ground station (control tower), pilots will broadcast their position and intentions on the MF and co-ordinate their activities. The arrival and departure procedures for uncontrolled aerodromes result in a safe and orderly flow of traffic and have proven effective at these and higher traffic levels.	Given the low traffic levels and pilot adherence to the rules and procedures that apply to MF areas and uncontrolled aerodromes, the removal of airport control service will have no impact on the safety of aircraft operations.	The risk of air to air, ground to air and ground to ground collisions is assessed to as low as reasonably practicable (ALARP). No mitigation is required.	N/A	N/A

Hazard/Issue	Existing Mitigation (defence) in the System	Risk Estimations	Risk Evaluation	Mitigation	Evaluation (of mitigation)
Issue Wind and Altimeter information will not be available to arriving and departing aircraft with the closure of the Tower and CWO.	In the event of the tower and CWO closure, the Toronto Buttonville airport will still be served by Limited Weather Information System (LWIS) which is already on site. The London FIC and Toronto ACC would have 24-hour access to wind speed and direction, temperature, dew point, and altimeter setting.	Given that wind and altimeter information continues to be available to pilots, the closure of the the Contract Weather Office will not adversely affect the safety of aircraft operations	The risk of wind & altimeter information not being available is assessed to be ALARP. No mitigation is required.	N/A	N/A
Issue With the closure of the control tower, pilots will not be able to obtain SVFR authorization.	Requests for SVFR may still be made with London FIC via the RCO.	Clearances for arriving and departing SVFR aircraft can be requested by the pilot from the London FIC via the RCO.	The risk due to unavailability of SVFR is assessed to be is assessed as ALAP. No mitigation required.	N/A	N/A

Hazard/Issue	Existing Mitigation (defence) in the System	Risk Estimations	Risk Evaluation	Mitigation	Evaluation (of mitigation)
Risk Vehicle operators will be required to monitor the MF when the tower is closed. The loss of vehicle control service and no on-site ATS presence for visual confirmation of aircraft or vehicles on the manoeuvring area may result in an increase in risk of runway incursions and aircraft-vehicle collisions.	Aerodrome Standards and Recommended Practices Manual (TP312) establishes the standards for operations at uncontrolled aerodromes. These standards state that radio equipped vehicles shall communicate on the MF. Vehicle operators will be monitoring and communicating on the MF. This allows pilots and vehicle operators to be aware of each other's intentions, which provides mitigation against a runway incursion when there is no on-site ATS presence and vehicle control service is not provided.	Given the low aircraft traffic along with the standards and procedures already in place for aerodrome vehicle operations and airport vehicle communication on the MF, the loss of vehicle control will not adversely affect the safety of operations.	The risk of runway incursions and aircraft-vehicle collisions is assessed to be ALARP No mitigation is required.	N/A	N/A

Hazard/Issue	Existing Mitigation (defence) in the System	Risk Estimations	Risk Evaluation	Mitigation	Evaluation (of mitigation)
Issue Runway lighting control during hours of darkness and/or reduced visibility will not be available.	Airfield lighting is an Airport Operator responsibility. NAV CANADA provides support only to the extent its on-site resources allow.	There are many airports within the ANS that rely on alternate control of during hours of darkness and/or reduced visibility.	The risk of unavailability of airport lighting is assessed to be as ALARP. No mitigation required.	N/A	N/A
Issue Loss of an on-site ATC presence will lead to increased IFR departure and arrival delays.	IFR approach clearances will continue being issued to pilots directly to pilots from the Toronto ACC on the Terminal frequency. Arrival reports can be made after landing, once the aircraft is down and clear, to the London FIC on the RCO frequency or by telephone. IFR departure clearances can be obtained from the London FIC via phone prior to departure, via the RCO frequency prior to departure or, if the weather permits, directly by the ACC after the pilot departs VFR.	Pilots can continue to receive IFR clearances in a timely manner. Due to the low volume of IFR traffic (Appendix A), it is expected there will be no increase in delays to IFR operations.	The risk of delays to IFR aircraft due to unavailability of clearances is assessed to be as ALARP. No mitigation required.	N/A	N/A

Hazard/Issue	Existing Mitigation (defence) in the System	Risk Estimations	Risk Evaluation	Mitigation	Evaluation (of mitigation)
Issue There would be no notification of deteriorating runway surface conditions or requirement for runway maintenance. Consequently Runway Condition Reports (RCRs) could be inaccurate which may impact safety of aircraft operations.	RCRs include the time when the report was produced. If the runway conditions change and the airport operator does not update the RCR on their own initiative, then pilots would be required to assess the conditions based on the most recent RCR and the weather conditions that have prevailed since the RCR was produced. This scenario is commonplace throughout the ANS. Pilots assess the risks associated the possibility of changing runway conditions and adjust their operations accordingly.	The production and forwarding of Runway Condition Reports are the responsibility of the airport operator. Runway Condition Reports may still be filed by the airport operator through the London FIC. No delay in making these reports available to pilots is anticipated.	The risk of a runway excursion due to the lack of runway conditions information is assessed to be as ALARP. No mitigation is required.	N/A	N/A