




**To:** Planning Committee **Date:** May 8, 2017  
**From:** Joe Erceg, MCIP **File:** 08-4040-01/2017-Vol 1  
 General Manager, Planning and Development  
**Re:** **Richmond Response: YVR Proposed Phase 2 North Runway End Safety Areas (RESA) Options**

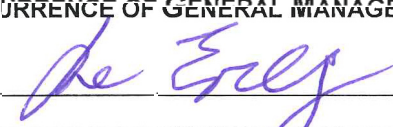

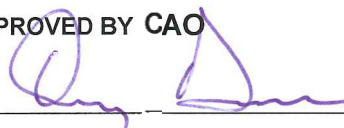
**Staff Recommendation**

1. That the staff report titled “Richmond Response: YVR Proposed Phase 2 North Runway Safety End Areas (RESA) Options”, dated May 8, 2017 from the General Manager, Planning and Development be received for information; and
2. That the staff recommendation to advise the Vancouver International Airport Authority (YVR) that the City of Richmond supports YVR’s proposed Option 2 be endorsed.



Joe Erceg, MCIP  
 General Manager, Planning and Development  
 (604-276-4083)

Att. 3

<b>REPORT CONCURRENCE</b>	
<b>CONCURRENCE OF GENERAL MANAGER</b>	
	
<b>REVIEWED BY STAFF REPORT / AGENDA REVIEW SUBCOMMITTEE</b>	<b>INITIALS:</b>
	
<b>APPROVED BY CAO</b>	
	

## Staff Report

### Origin

On April 5, 2017, the Vancouver International Airport Authority (YVR) invited the City to comment on its proposed two Phase 2 Runway End Safety Areas (RESA) Options for the North Runway by May 23, 2017 (Attachment 1).

This report supports Council's 2014-2018 Term Goal #5 Partnerships and Collaboration:

*Continue development and utilization of collaborative approaches and partnerships with intergovernmental and other agencies to help meet the needs of the Richmond community.*

5.1. *Advancement of City priorities through strong intergovernmental relationships.*

### Findings of Fact

#### What are Runway End Safety Areas (RESAs)?

Transport Canada recommends that YVR (and other Canadian airports), construct runway end safety areas (RESA) which are a specialized surface, located at either end of a runway, designed to protect passengers, crew and the aircraft in the unlikely event of an aircraft undershoot or overrun of the runway. RESAs are intended to reduce the severity of aircraft damage, increase passenger safety and provide an area for better access for emergency response vehicles. In response, YVR is proactively providing RESAs for its three runways (north, south and crosswind). YVR is following best practices (e.g., the length of each RESA will be a minimum length of 300 m with widened shoulders)

#### YVR Phase 1 RESA Project

Phase 1 of the YVR's RESA Project involves YVR providing RESAs for the South and Crosswind runways which started in 2011. YVR is currently completing the construction of the third and final year of construction of Phase 1 of its RESA project. Phase 1 included the following considerations: have low noise impacts both during and after construction, no impact on the foreshore and maintain existing runway lengths (i.e., no extension of the takeoff and landing distances). Phase 1 generated few problems (e.g., YVR addressed a few Burkeville noise and dust complaints). For information, Attachment 2 contains the September 23, 2014 memo to Council regarding Phase 1.

#### YVR Phase 2 RESA Project

As Phase 1 nears completion, YVR is planning for Phase 2 which will add RESAs to the North Runway by identifying two RESA options, as shown on page 7 of YVR's Runway End Safety Area (RESA) - Phase 2 - North Runway Discussion Guide (Attachment 3).

### Summary of Phase 2 North Runway RESA Options

- Option 1: Proposes RESAs: for both ends (e.g., 300m x 120m) and involves:
  - No perceptible increase in noise,
  - No change when landing from the east, (due to the Arthur Laing Bridge and Casino),
  - However, as the runway departures to the west would have 150m less length, the new airplane takeoff threshold point would move eastward, to accommodate the RESA within the westerly dyke,
  - This Option negatively affects flights heading north (e.g., Asia Pacific) which may only accommodate smaller planes – and one reason why YVR favours Option 2.
  
- Option 2: Proposes RESAs: West end 300m x 120m, same as Option 1, but a longer East at 450m x 120m and involves:
  - No perceptible increase in noise,
  - Maintains existing runway performance,
  - Enables YVR to have 20% more capacity, as it allows a mix of arrivals and departures on the same runway,
  - Reflects public YVR 2037 Master Plan feedback, as people said that they wanted more growth (e.g., in flights), by using the existing runway capacity, and
  - Provides more options for a possible future runway extension.

### Summary

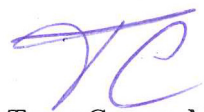
Staff advise that Option 2 is preferred, as it does not generate a perceptible increase in noise, enables YVR to have 20% more capacity and respects the public's request for more growth (e.g., in flights), while using the existing runway capacity,

### **Financial Impact**

None.

### **Conclusion**

On April 5, 2017, the Vancouver International Airport Authority (YVR) invited the City to comment on its proposed two Phase 2 Runway End Safety Areas (RESAs) Options for the North Runway by May 23, 2017. Staff advise that Option 2 is preferred as it has more benefits.



Terry Crowe, Manager,  
Policy Planning  
(604-276-4139)

Att. 1: YVR North Runway RESA Consultation

Att. 2: Council Memo Update: YVR Runway End Safety Areas (RESAs) September 30, 2014

Att. 3: YVR Runway End safety Area (RESA) - Phase 2 - North Runway Discussion Guide



As a key member of the community, we invite you to participate in a stakeholder meeting for Phase 2 of Vancouver International Airport's (YVR) Runway End Safety Area (RESA) project.

A RESA is a specialized surface, located at either end of a runway, designed to protect passengers, crew and the aircraft in the unlikely event of an aircraft undershoot or overrun of the runway. RESAs are required to improve safety. As an airport committed to excellence in safety, YVR is continuing to build RESAs which exceed the pending Canadian standard. RESA construction will be completed by 2020, in advance of the anticipated deadline for RESA implementation in Canada

YVR is currently undertaking the third and final year of construction of Phase 1 of its RESA project, which includes building RESAs on the South and Crosswind Runways. YVR met with community members in the fall of 2014 about Phase 1.

As Phase 1 nears completion, we are now planning for Phase 2 of the RESA project which will add RESAs to the North Runway. We have developed several options for adding RESAs to our North Runway, and will be consulting with our stakeholders and community for their input on these options.

The purpose of the stakeholder meeting is to:

- Present options for the North Runway RESAs, including our preferred option
- Listen to and discuss your questions and feedback
- Get your input on RESA construction
- Discuss how you would like to be informed during Phase 2 construction
- Receive your questions and input on options for RESAs on the North Runway
- Keep you informed about major projects planned at YVR

Due to space limitations, meetings are by invitation only. Please let us know if someone else in your organization should attend or if you have colleagues who may be interested. Details for the meetings are as follows:

Date: Tuesday, April 11, 2017

Time: 9:30 to 10:30 a.m. or 3:30 to 4:30 p.m.

Location: Vancouver Airport Authority – Sea to Sky Room

Address: Vancouver International Airport, Domestic Terminal Building, Level 4

**Please RSVP by Monday, April 10, 2017 to Andrea Pham at [community\\_relations@yvr.ca](mailto:community_relations@yvr.ca) or 604-276-6772.**

Additionally, we will be holding a public open house on Monday, April 24, 2017, from 5:00 to 7:00 p.m. in the Graham Clarke Atrium at Vancouver International Airport, Link Building, Level 3. We will also be hosting an information booth at our Annual Public Meeting in YVR's East Concourse on May 11, 2017 at 3:00 p.m.

Thank you for your consideration. We look forward to your participation.

Sincerely,

The North Runway RESA Project Team

**PLN - 229**



# City of Richmond

## Memorandum Planning and Development Department Transportation

**To:** Mayor and Councillors  
**From:** Victor Wei, P. Eng.  
 Director, Transportation  
 Terry Crowe  
 Manager, Policy Planning  
**Date:** September 30, 2014  
**File:** 01-0153-01/2014-Vol 01  
**Re:** **Update: YVR Runway End Safety Areas (RESAs)**

The purpose of this memorandum is to provide an update regarding YVR's upcoming Runway End Safety Area (RESA) initiative.

On September 23, 2014, YVR staff and consultants met with cross-divisional City staff to provide information and an update regarding YVR's planned Runway End Safety Area (RESA) construction project. Departments attending included: Transportation, Policy Planning, Emergency Programs, Engineering, and Sustainability. The RESA project is one of YVR's initiatives outlined in its 20-year Master Plan (*YVR: Your Airport 2027*), which was approved by Transport Canada in 2008.

RESA is a pending requirement from Transport Canada that would require an additional area at each end of a runway to enhance aircraft and passenger safety. These areas would reduce the severity of damage to an aircraft should one overrun or undershoot during landing thereby increasing passenger safety, as well as providing an area for better access for emergency response vehicles. There is no change to the operational length of the runway. In anticipation of the enactment of the Canadian standard within the next few years, YVR is proactively planning to construct RESAs for its three runways (north, south and crosswind) that will meet existing international safety recommendations. Following these best practices, the length of each RESA (300 m with widened shoulders) will exceed the anticipated Canadian standard of 150 m.

Option analysis for the south and crosswind runways began in 2011; construction will occur on these runways first due to relatively simpler operational, environmental and financial factors. Potential options were evaluated based on the following criteria: water and land impacts, land use, cost, construction, operational efficiency, and noise. The preferred options do not impact the foreshore, maintain existing runway lengths (i.e., there is no extension of the takeoff and landing distances) and have low noise impacts both during and after construction (see Attachment 1).

Modelling results by YVR indicate that there may be a negligible increase in noise levels for some areas of Burkeville, as a limited number of larger aircraft taking off to the west may begin their takeoff roll where the new pavement will be added for the RESA at the eastern end of the south runway, which would bring those aircraft approximately 200 m closer to the Burkeville area. The estimated increase in noise level is three decibels, which is imperceptible to humans, and operational procedures such as the use of reduced thrust will help mitigate noise exposure. This increased noise level would still be lower than what Burkeville residents currently experience for takeoffs to the east; these latter noise levels will

not change. On-going noise impacts will be monitored via YVR’s network of Noise Monitoring Terminals throughout the community.

The preferred options being presented for consultation with stakeholder and the general public have already been presented to YVR’s Environmental Advisory and Noise Management Committees and have been endorsed by YVR’s Board of Directors. Stakeholder consultation commenced in early September 2014. Table 1 summarizes the schedule and identifies the participation or invitation of any City-related committees and organizations. A public information session will be held on September 30, 2014, from 4:00 pm to 8:00 pm, at the River Rock Resort & Hotel, Whistler “C” Ballroom (3<sup>rd</sup> Floor, East Tower, hotel side), 8811 River Road, Richmond, which staff will attend. Notices of this meeting have been placed in the Vancouver Sun, as well as local newspapers. Information is also posted on YVR’s website (<http://www.yvr.ca/en/business-at-yvr/construction/projects.aspx>) including a Discussion Guide and on-line survey, which closes on October 31, 2014. A consultation summary report will be prepared and posted on YVR’s website. YVR staff have offered to appear before Council to discuss the results of the survey findings. Staff will co-ordinate this meeting at a mutually convenient time.

<b>Date</b>	<b>Group</b>	<b>Attended/Invited</b>
September 9	Agricultural-Goods Movement	<ul style="list-style-type: none"> <li>• Richmond Agricultural Advisory Committee: staff liaison attended</li> <li>• Richmond Farmers' Institute: invited</li> </ul>
September 18	Environmental Organizations	<ul style="list-style-type: none"> <li>• Garden City Conservation Society: member attended</li> <li>• Richmond Advisory Committee on the Environment: 2 members attended</li> </ul>
September 23	City of Richmond	<ul style="list-style-type: none"> <li>• Staff from Transportation, Policy Planning, Emergency Programs, Engineering, and Sustainability</li> </ul>
September 25	Community Organizations	<ul style="list-style-type: none"> <li>• East Richmond Community Association</li> <li>• Hamilton Community Association</li> <li>• Sea Island Community Association</li> <li>• Steveston Community Society</li> <li>• Thompson Community Association</li> <li>• West Richmond Community Association</li> <li>• South Arm Community Association</li> <li>• City Centre Community Association</li> </ul>
September 30	Business-Tourism-Recreation	<ul style="list-style-type: none"> <li>• Tourism Richmond</li> <li>• Richmond Economic Advisory Committee</li> <li>• Richmond Nature Park</li> <li>• Richmond Chamber of Commerce</li> <li>• Steveston 20/20</li> <li>• Steveston Merchants Association</li> </ul>
September 30	General Public	<ul style="list-style-type: none"> <li>• General public</li> <li>• Staff will attend</li> </ul>

Construction is scheduled to occur during the summer months commencing in 2015 for both ends of the crosswind runway and the west end of the south runway. The east end of the south runway will require preload from Winter 2015 to Spring 2016, with construction occurring in Summer 2016 and 2017. Staff will continue to work with YVR to manage the construction impacts on the surrounding community.

Planning for RESAs on the north runway is currently in the early stages and consultation with the public and stakeholders will occur when more information is available.

Please contact either of us, if you have any questions or would like further information.

Victor Wei, P. Eng.  
Director, Transportation

Terry Crowe, RPP, MCIP  
Manager, Policy Planning

September 30, 2014

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Att. 1

VW:dc

pc: SMT

Brendan McEwen, Manager, Sustainability

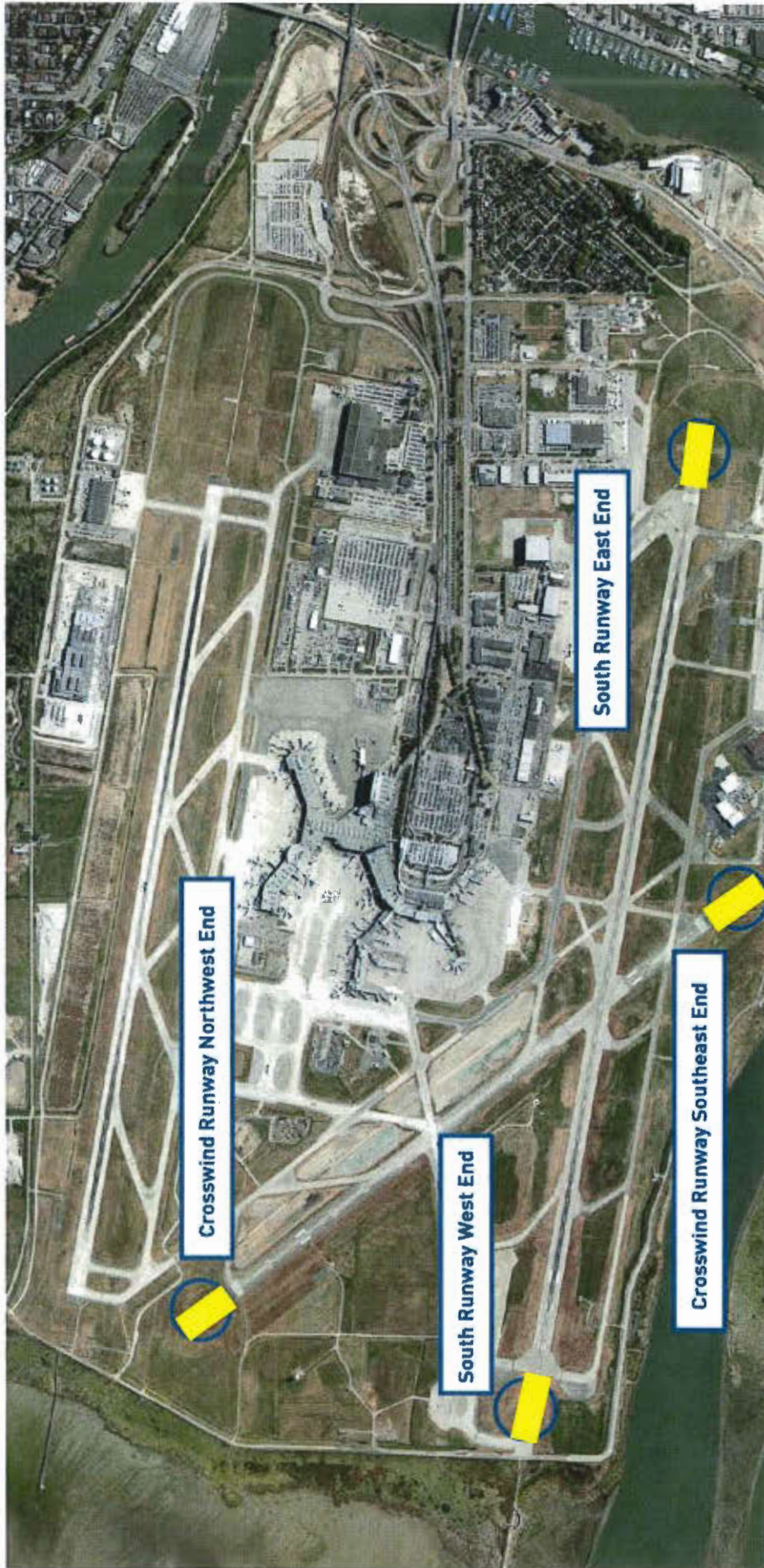
John Irving, Director, Engineering


Lloyd Bie, Manager, Engineering Planning

Tim Wilkinson, Deputy Fire Chief

Deborah Procter, Manager, Emergency Programs

Ted Townsend, Senior Manager, Corporate  
Communications



-  RESA = 300 m in length by 120 m in width
- South Runway = 3,500 m in length
- Crosswind Runway = 2,200 in length





Beyond, Every Day.

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**Runway End Safety Area (RESA) – Phase 2 – North Runway**

# DISCUSSION GUIDE





## YVR's RESA Consultation

# ABOUT YVR

Vancouver International Airport (YVR) is Canada's second busiest airport. It is managed by Vancouver Airport Authority, a community-based, not-for-profit organization. YVR is a key hub between Asia and the Americas, connecting people and businesses to more than 120 non-stop destinations worldwide.

In 2016, YVR served a record 22.3 million passengers – a number that continues to grow, and accommodated over 319,000 aircraft movements including float planes and helicopters. More than 23,000 people work at YVR, an important economic contributor that generates \$5.3 billion in total gross domestic product and \$11.7 billion in total economic output into the Canadian economy annually.

In 2016, YVR received CAPA Centre for Aviation's prestigious Airport of the Year Award and in 2017 was voted Best Airport in North America for the eighth consecutive year in the Skytrax World Airport Awards: a global benchmark of airport excellence.

## RUNWAY FACTS

→ YVR has three runways:

- South Runway (3,505 metres long)
- Crosswind Runway (2,225 metres long)
- North Runway (3,030 metres long)

→ YVR also considers the Fraser River as a runway. It supports float plane activities as part of YVR's south-side operations.



**YVR's RESA Consultation**

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## YVR's RESA Consultation

# WHY RESAs?

### WHAT ARE RESAs?

RESA stands for Runway End Safety Area. It is a specialized area at the end of a runway designed to protect aircraft from damage in the unlikely event of an undershoot or overrun which in turn protects passengers and crew from injury and the aircraft from extensive damage. RESAs are designed to support the weight of aircraft without risk of major structural damage to the aircraft. RESAs also provide more ease of access for emergency-response vehicles. A RESA does not extend the runway length for aircraft arriving and departing. It is similar to a shoulder on a highway, which provides additional safety to motorists.

### WHY BUILD RESAs?

Excellence in safety is at the core of all decisions made at YVR. YVR is proactively adding RESAs to all its runways to meet the international standard of 300 metres, which is anticipated to exceed the pending Canadian standard.

An undershoot occurs when a landing aircraft touches down before reaching the runway.

An overrun occurs when an aircraft travels beyond the end of the runway during take off or landing.

## YVR's RESA Consultation

# CONSULTATION PROCESS

In 2014, YVR consulted with the public and key stakeholders on Phase 1 of the RESA project, which included the design and construction of 300 metre RESAs on both ends of the South and Crosswind Runways. Construction on the South Runway RESAs began in the summer of 2015 and will be completed by the end of 2017.

As Phase 1 of the RESA project nears completion, we are now planning for Phase 2 of the RESA project as we add RESAs to the North Runway. We want to share with you the details of this project and collect public input.

### HOW TO PARTICIPATE

We recognize the value and importance of our stakeholders and community to provide input on major projects prior to construction. There are multiple ways the public can provide input on the construction of Runway End Safety Areas on YVR's North Runway. The consultation period runs from April 10 to May 23, 2017. Here's how you can participate:

- Open House – A drop-in style, informal meeting accessible to all members of the community. The Open House is scheduled to take place on April 24, 2017.
- Stakeholder Meetings – Specific stakeholder groups will be invited for facilitated discussions. Groups include the Environmental Advisory Committee, Airline Consultative Committee, Aeronautical Noise Management Committee and local government and its representatives.
- Feedback Form – The community is encouraged to complete the feedback form, available online at [yvr.ca/resa](http://yvr.ca/resa) or in person at one of our consultation events.
- Email – Stakeholders and community members are encouraged to email questions to [community\\_relations@yvr.ca](mailto:community_relations@yvr.ca), and a member of the RESA team will answer your questions.

### JOIN OUR OPEN HOUSE!

April 24, 2017

5:00 p.m. – 7:00 p.m.

Graham Clarke Atrium

Level 3, Domestic Terminal Building

Vancouver International Airport



## YVR's RESA Consultation

# RESA PHASE 2

### PROJECT DETAILS

In 2016, YVR began looking at options to build Runway End Safety Areas on the North Runway. YVR is now consulting on selected options to accommodate RESAs on the North Runway. This multi-year project will see RESA Phase 2 construction take place each summer from 2018 to 2020.

Although there is limited land on both ends of the North Runway, we have eliminated options that do not allow for 300 metre RESAs. The North Runway is used by our largest aircraft and we are committed to our role as an international hub with an unwavering commitment to safety.

In Phase 1 of our RESA project, the community asked that we address long-term noise and air quality impacts for nearby residential areas as well as impacts to the foreshore and migratory birds. They also expressed concerns about building RESAs or a runway extension through our dyke system because of potential impacts to the foreshore. We used this feedback to inform early decision-making in the Phase 2 RESA planning.

### FAST FACTS

- North Runway RESA option development began in 2016
- A variety of options were considered in 300m lengths
- A multi-departmental team evaluated RESA options and reached a consensus recommendation on preferred options
- The preferred options were presented to YVR's Environmental Advisory, Airline Consultative and Aeronautical Noise Management Committees.



In addition to our Phase 1 RESA consultation, in the fall of 2016 we were consulting with our communities about YVR's 2037 Master Plan Phase 2. Feedback from the community showed support for YVR to building infrastructure incrementally when needed to enhance safety and support our growth.

As part of early design work on Phase 2, we applied the community feedback and identified and analyzed several possible RESA options. We explored options that included a runway extension to the west through the dyke into the foreshore but we decided this was not an option for further consideration based on cost, current demand and community input during Phase 1.

We also explored the option to include a runway extension at the east end of the North Runway. In addition to examining options for RESAs on the North Runway, the assessment of aircraft performance included determining the benefits of whether we should extend the North Runway as part of the RESA project.

The current length of the North Runway is 3,030 metres compared to the South Runway which is 3,505 metres. Adding more length to the North Runway increases efficiency, allows for more flexibility in the use of the runway system and in turn supports sustainability goals to reduce aircraft GHG emissions. We do not recommend this extension, but will revisit this in the future if and when we see the need for longer runway length.

The final options for the North Runway best maintain YVR's strong operational, financial and environmental performance.



## YVR's RESA Consultation

# NORTH RUNWAY RESA OPTIONS

YVR used the following criteria to comprehensively evaluate RESA options for the North Runway. The criteria used to evaluate the options include:

- Safety
- Sustainability
  - Land use
  - Emissions
  - Noise
  - Community Impact
- Cost
  - Construction
  - Operations
- Operational efficiency
- Runway performance

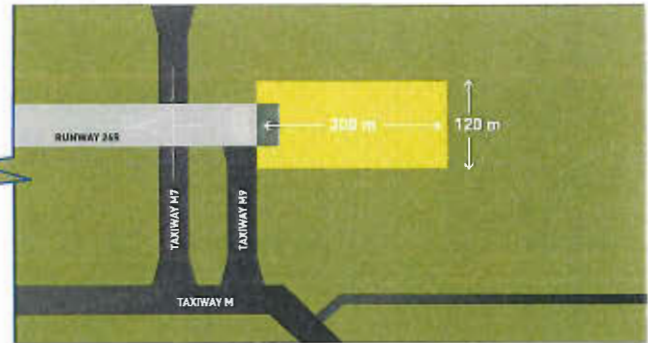
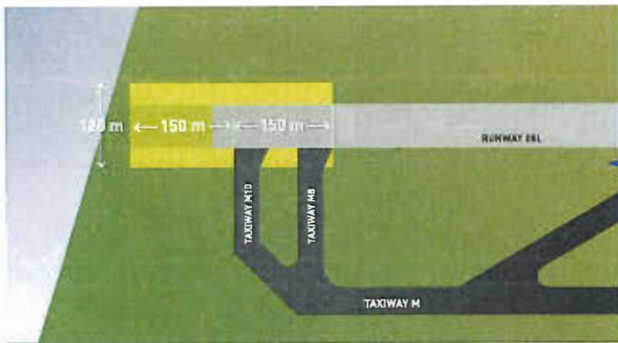




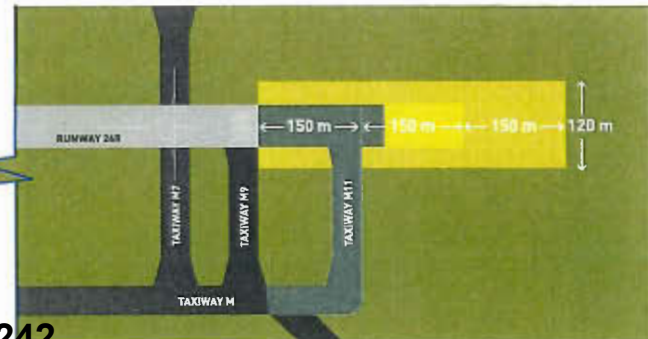
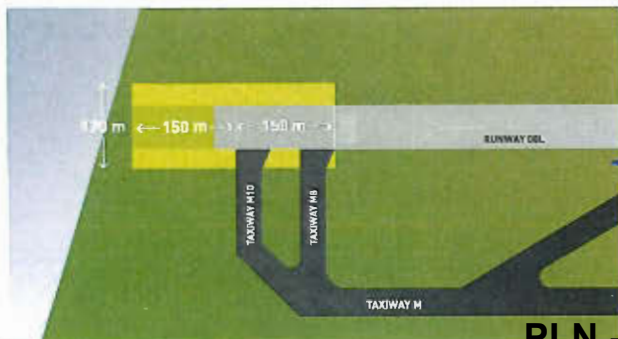
West End RESA

East End RESA

OPTION 1



OPTION 2



# PREFERRED OPTION

Based on the evaluation criteria, YVR recommends Option 2 because it helps ensure we maintain runway performance for our airline partners while planning for potential future needs. This option also takes into account community and stakeholder consultation feedback from Phase 1.

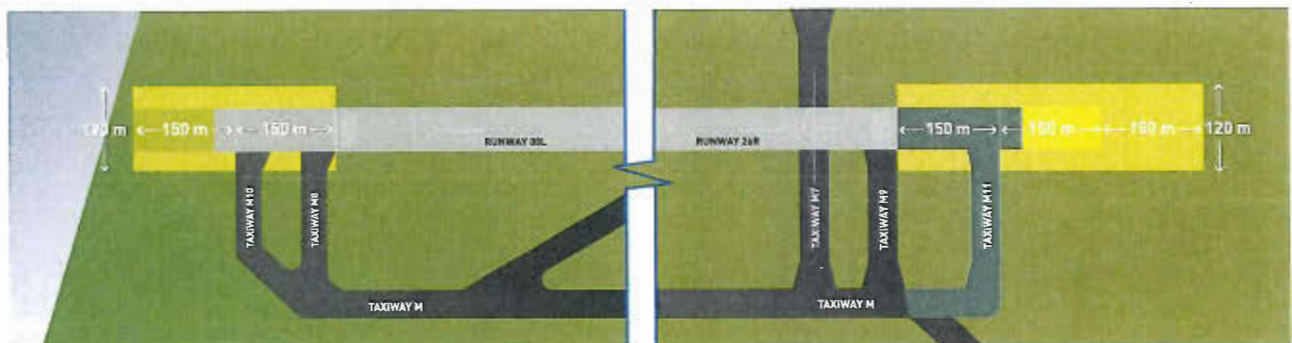
YVR recommends Option 2 for the following reasons:

- Option 2 results in no perceptible changes to noise.
- Operating and maintenance costs of Option 2 would likely be similar to today.
- Option 2 results in runway capacity similar to today.
- Option 2 provides YVR options for a future runway extension
- The existing Take-off Run Available (TORA) on Runway 08L and on 26R is maintained at 3,030 m.

## TAKE-OFF RUN AVAILABLE

→ The length of runway declared available and suitable for the ground run of an airplane taking off.

### LEADING OPTION - OPTION 2





## YVR's RESA Consultation

# BEING A GOOD NEIGHBOUR

### NOISE CONCERNS?

- Email: [noise@yvr.ca](mailto:noise@yvr.ca)
- Phone: 604 207 7077

## CONSTRUCTION AND NOISE IMPACTS

YVR's commitment to its neighbouring communities includes managing airport noise to balance the community's need for safe, convenient 24-hour air travel with enjoyable urban living.

Building RESAs on the North Runway is a multi-year project. As the North Runway is typically closed in the evenings, there will be little to no change to normal runway usage at night and construction noise levels will also be minimal and is not anticipated to be significantly perceptible to local area residents.

## ENVIRONMENT

YVR strives to address all environmental and social impacts associated with airport development. Environmental factors were considered during the initial evaluation of RESA options. Options with significant environmental impacts to sensitive aquatic habitats were eliminated.

All of the options are located entirely on airport property and no sensitive environmental features or habitat will be affected by any of the proposed options. A detailed environmental review of the selected option will be conducted and will address a variety of components including:

- Soil quality
- Surface water
- Vegetation
- Fish and wildlife
- Air quality
- Noise
- Traffic
- Archaeological resources

**PLN - 244**



## YVR's RESA Consultation

# STAY INFORMED

YVR is committed to providing accurate and timely information. Please let us know how best to keep you informed about the North Runway RESA construction. Your input is a valuable part of our process.

## KEEP IN TOUCH

We encourage you to get involved and ask questions.

→ Phone: 604 276 6772

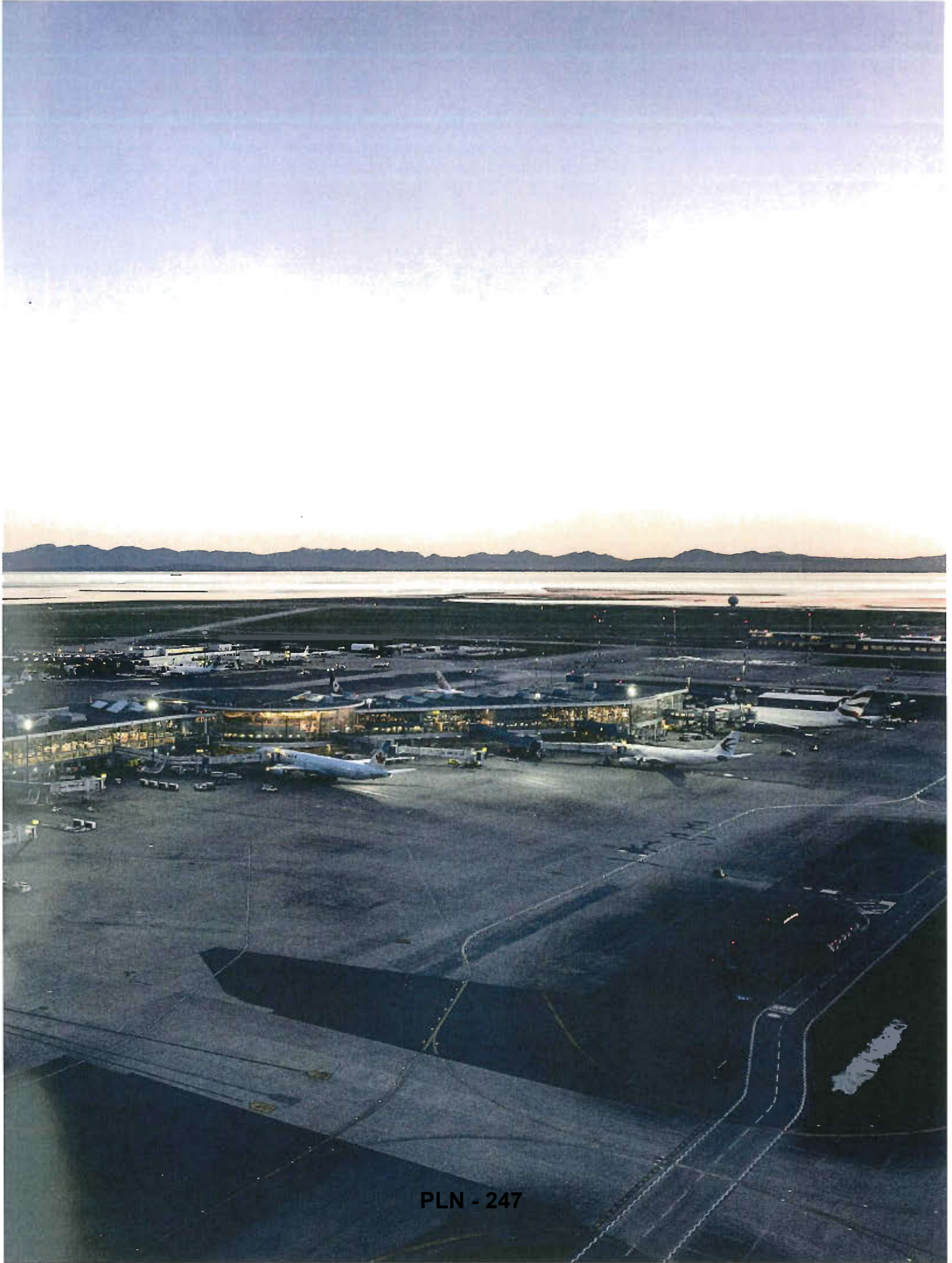
→ Email:

[community\\_relations@yvr.ca](mailto:community_relations@yvr.ca)

→ Website: [yvr.ca/resa](http://yvr.ca/resa)



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