



Beyond, Every Day.

Runway End Safety Area (RESA)

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 the Americas and Asia, connecting people and businesses to more than 109 destinations worldwide.

In 2013, YVR served a record 17.97 million passengers – a number that continues to grow. More than 23,600 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 2014, YVR was voted Best Airport in North America for the fifth year in a row and Best Airport in the World for its size category of 10 to 20 million passengers at the 2014 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 of sort. It supports float plane activities as part of YVR's south-side operations.

TABLE OF CONTENTS

YVR's RESA Consultation Program 4

Consultation To Date 5

Why Build RESAs? 6

Phasing in RESAs at YVR 7

Selection Process 8

Selected Options 10

YVR – Economic Contributions and Benefits 11

Environmental Review 13

Noise Management 14

Construction Milestones 17

Stay Informed 18

YVR's RESA Consultation

YVR's RESA CONSULTATION PROGRAM

Runway End Safety Areas (RESAs) at YVR will help protect passengers and limit damage to aircraft in the unlikely event that an aircraft were to overrun or undershoot a runway. There is already an international RESA recommendation and it is expected that a national standard will be implemented soon.

YVR is proactively implementing international industry recommendations for RESAs in order to remain leading edge, drive traffic and create jobs. RESAs will first be built on the South and Crosswind Runways due to operational, environmental and financial factors. Planning for RESAs on the North Runway is in the early stages. More information will be shared with the community and stakeholders once technical studies required for options analysis are completed.

Planning for RESAs on the South Airfield has been underway since 2011 and includes a range of stakeholder consultation:

- Presentations to YVR's Environmental Advisory and Aeronautical Noise Management Committees
- Meetings with a variety of community and stakeholder groups
- Concurrent consultation with First Nations
- Public Information Session:
 - September 30 from 4 – 8 p.m.**
 - River Rock Resort & Hotel (Whistler C Room)**
 - 8811 River Road, Richmond**
- Online information: www.yvr.ca/resa

THE PURPOSE OF THE RESA CONSULTATION PROGRAM IS TO:

- Present the selected RESA options for the South and Crosswind Runways
- Hear and discuss your questions and feedback
- Discuss how you would like to be informed during construction
- Receive your questions and input to begin developing options for RESAs on the North Runway



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CONSULTATION TO DATE

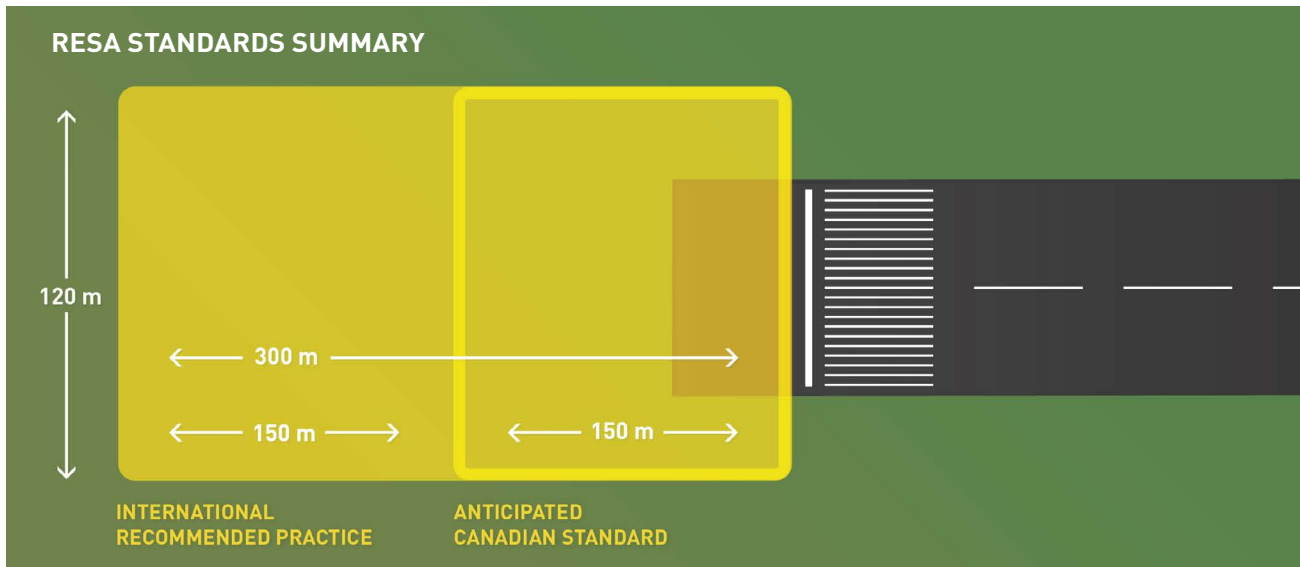
Since early 2013, YVR has had discussions with stakeholders regarding RESAs on the South and Crosswind Runways. Presentations to the Environmental Advisory and the Aeronautical Noise Management Committees enabled YVR to engage with stakeholders early in the evaluation process.

ENVIRONMENTAL ADVISORY COMMITTEE

- Provides input and suggestions on YVR's environmental practices and programs
- Represents diverse interests, including community and environmental groups, industry, municipal government and First Nations
- Provided valuable input on the South and Crosswind Runway RESA options
- Recommended RESA as a standing item at future committee meetings

AERONAUTICAL NOISE MANAGEMENT COMMITTEE

- Provides a forum for community and industry stakeholders to discuss noise management at YVR
- Representatives include local citizens, municipal government, First Nations, airlines, industry associations, NAV CANADA and Transport Canada
- Offered feedback on the RESA community engagement plan and consultation tools
- Recommended RESA as a standing item at future committee meetings



YVR's RESA Consultation

WHY BUILD RESAs?

RESAs are specialized areas at the end of a runway that protect passengers and reduce the severity of damage to an aircraft in the unlikely event of an overrun or undershoot. An undershoot occurs when an aircraft touches down before reaching the runway. An overrun occurs when an aircraft travels beyond the end of the runway during a rejected takeoff or while landing.

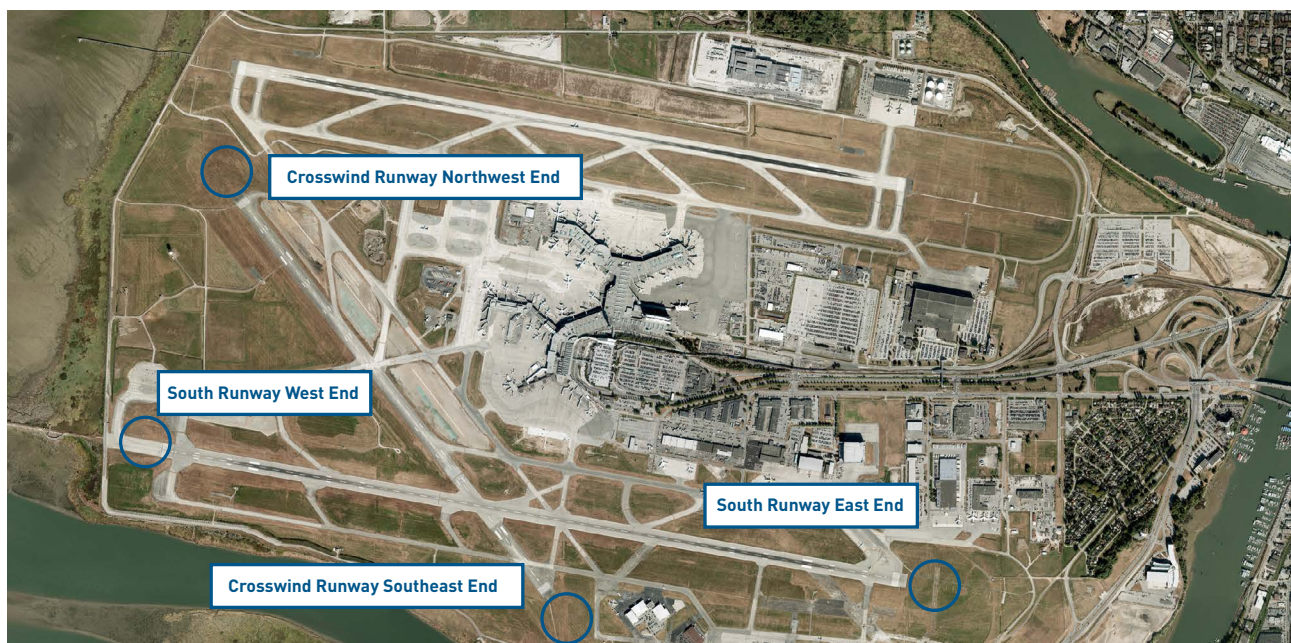
By providing an area that is free of obstacles and can support the weight of an aircraft without major structural damage, a RESA increases the level of safety to the travelling public. It also provides an area that allows ease of access for emergency-response vehicles.

As an international airport committed to excellence in safety, YVR is proactively implementing RESAs to meet international recommendations and exceed the anticipated Canadian standard.

RESA STANDARDS

Excellence in safety is at the core of all decisions made at YVR. The 300-metre RESAs on YVR's South and Crosswind Runways will:

- Exceed the anticipated Canadian standard of 150 metres
- Meet existing international safety recommendations endorsed by the International Civil Aviation Organization (ICAO), the Federal Aviation Administration (FAA) and the European Aviation Safety Agency (EASA).



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PHASING IN RESAs AT YVR

PHASE 1 – SOUTH AIRFIELD RESAs (2015, 2016, 2017)

YVR is building RESAs first on the South and Crosswind Runways due to operational, environmental and financial factors. This will be a multi-year project with nightly closures of the South Runway required for up to four months annually. During these closures, the North Runway will be used at night for both landings and takeoffs. As the North Runway is normally closed at night, YVR will aim to complete work efficiently and in the shortest duration possible to minimize impacts on the community.

PHASE 2 - NORTH RUNWAY RESA (TIMELINE TBD)

YVR is in the early stages of planning for RESAs on the North Runway where options are more complex and may include work in the foreshore or runway extensions. No decisions have been made.

YVR will assess all options and seek significant community involvement, as well as all required environmental approvals during this phase of the project.

UNDER CONSTRUCTION

- RESAs for the South and Crosswind Runways will be 300 metres long, added to both ends of the existing runways.
- Due to YVR's soil conditions and wet climate, RESAs will consist of a combination of concrete, asphalt and gravel.
- The east end of the South Runway will be preloaded with sand for six months in 2015 prior to pavement construction in 2016 and 2017.



YVR's RESA Consultation

SELECTION PROCESS

YVR analyzed several possible RESA options. The chosen options for the South and Crosswind Runways best maintain YVR's strong operational, financial and environmental performance.

- RESA option development began in 2011
- A variety of options were considered, in both 150m and 300m RESA lengths
- In 2013, the decision was made to focus on 300m RESAs to ensure that as an international airport, YVR meets international recommendations wherever possible
- A multi-departmental team evaluated 300m RESA options and reached a consensus recommendation on the preferred options
- The preferred options were presented to YVR's Environmental Advisory and Aeronautical Noise Management Committees

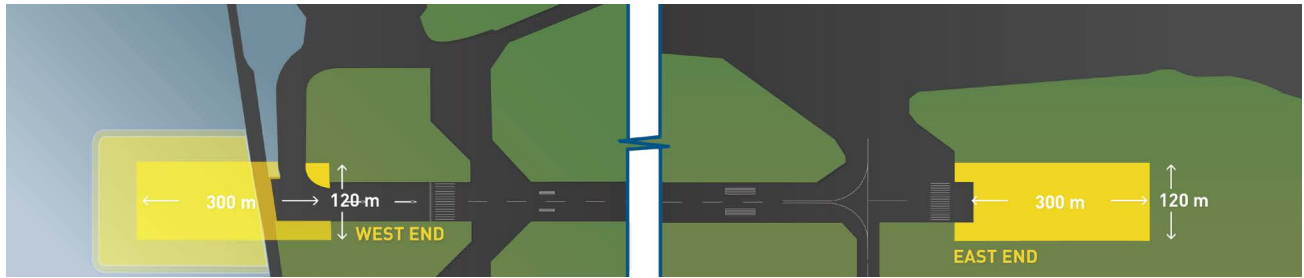
RESA OPTIONS

YVR comprehensively evaluated two RESA options for each of the South and Crosswind Runways. A variety of criteria were used to evaluate the options including:

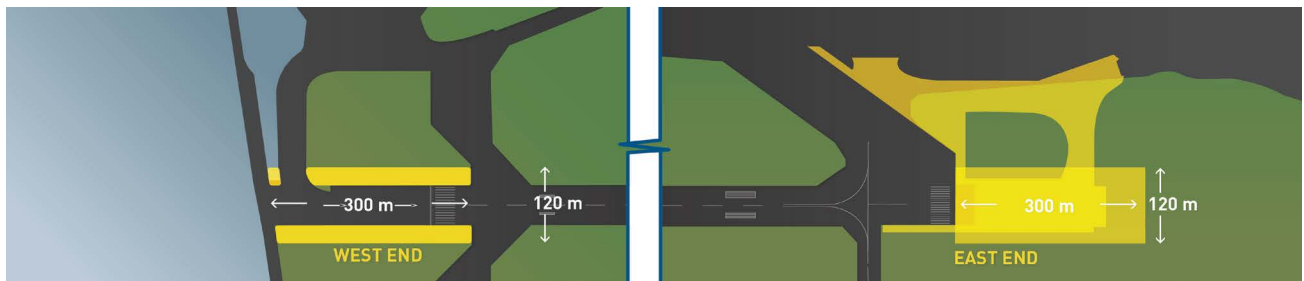
- Water and land impacts
- Land use
- Cost
- Construction
- Operational efficiency
- Noise

SOUTH RUNWAY RESA OPTIONS

OPTION 1

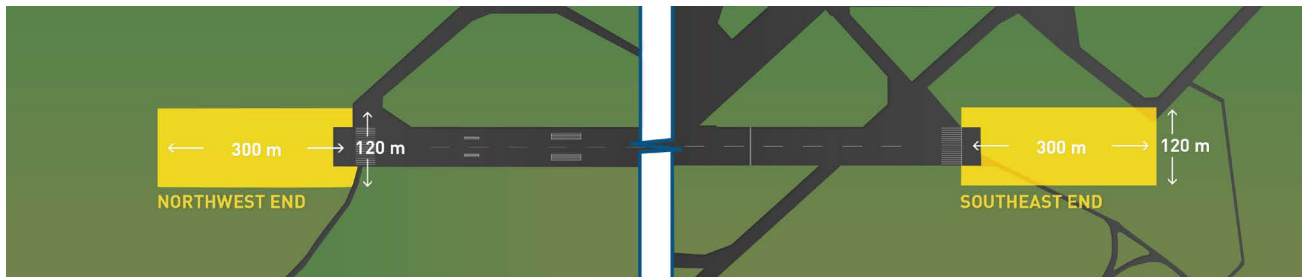


OPTION 2

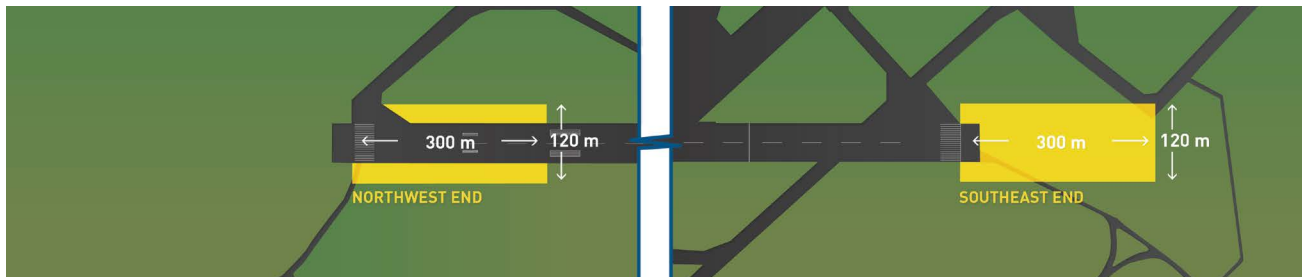


CROSSWIND RUNWAY RESA OPTIONS

OPTION 1



OPTION 2



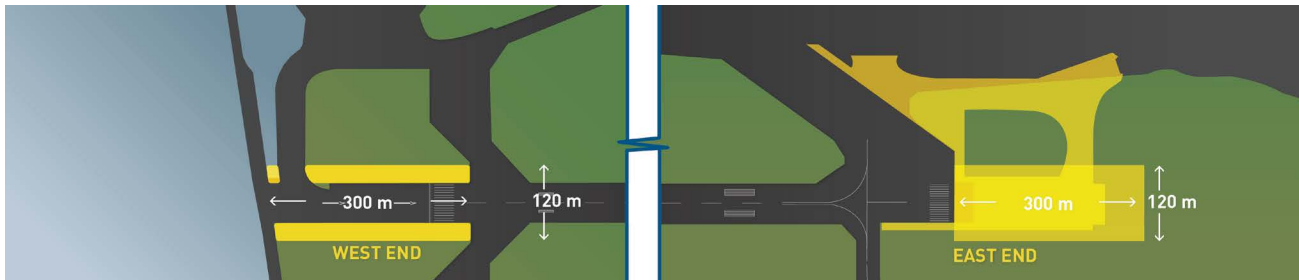
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SELECTED OPTIONS

The selected RESA options for the South Runway (Option 2) and the Crosswind Runway (Option 1) met all of YVR's criteria and offered the benefits of:

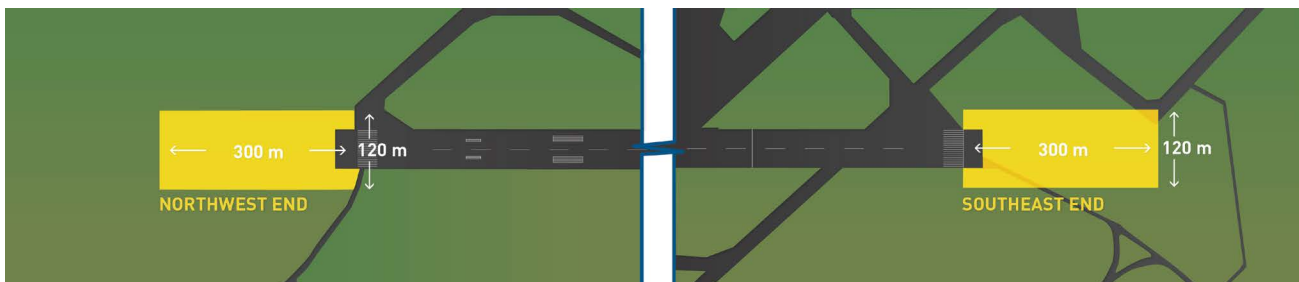
- Low noise impact
- Lower capital cost
- Shorter construction duration
- Preserved existing Takeoff Run Available on both runways
- Preserved existing Landing Distance Available on the Crosswind Runway
- No replacement of approach lighting system on the Crosswind Runway
- No impact to aquatic habitat in the foreshore

SOUTH RUNWAY – SELECTED OPTION – OPTION 2



- Repurpose and widen existing pavement at the west end
- Construct new runway, taxiway and RESA pavement at the east end

CROSSWIND RUNWAY – SELECTED OPTION – OPTION 1



- Construct gravel RESAs at both ends



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YVR ECONOMIC CONTRIBUTIONS AND BENEFITS

Excellence in safety is at the core of everything YVR does. As an international airport, YVR must meet global industry recommendations for RESAs in order to remain competitive, drive traffic and create jobs.

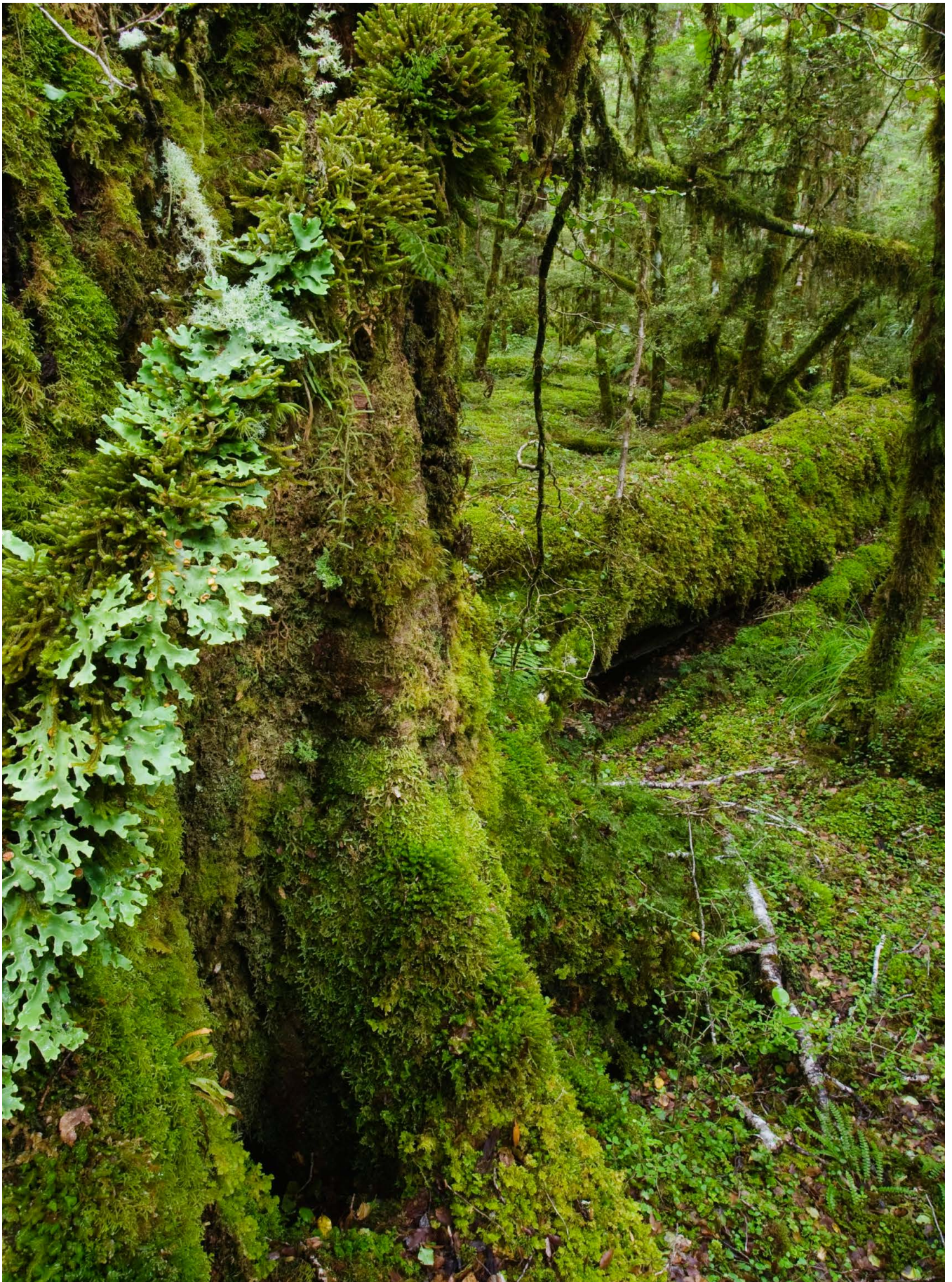
GLOBAL COMPETITIVENESS

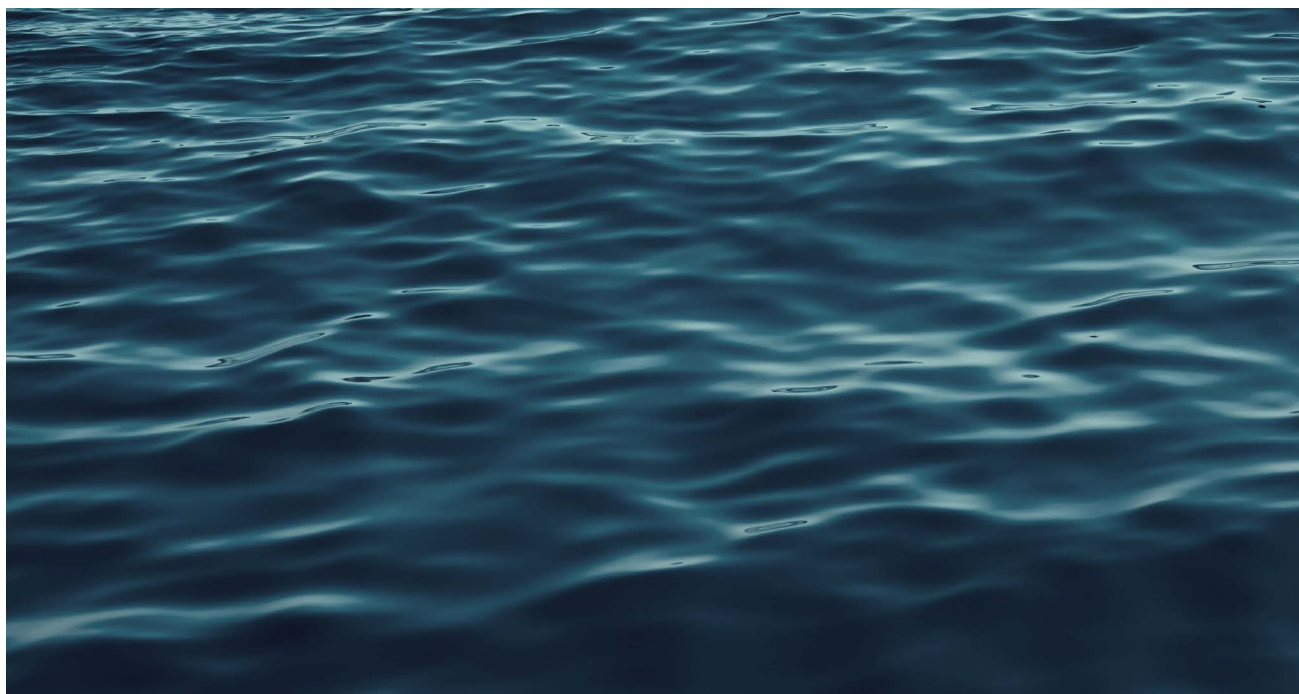
YVR is an important gateway to the Asia-Pacific that transports local goods and services to market and strengthens British Columbia's presence as an international trading partner.

- YVR is in growth mode. In 2013, YVR served 17.97 million passengers and it is on pace to serve 19 million passengers in 2014.
- YVR is an important economic generator. Every new, daily international flight creates 150 to 200 new direct jobs at the airport and another 300 to 400 direct jobs in B.C.'s tourism industries.

ECONOMIC BENEFITS

- YVR provides significant benefits to the local and provincial economy.
- More than 23,600 people work on YVR's Sea Island home in primarily travel-related positions.
- YVR generates \$5.3 billion in total gross domestic product (GDP) and \$11.7 billion in total economic output into the Canadian economy annually.





YVR's RESA Consultation

ENVIRONMENTAL REVIEW

YVR engaged in an independent and thorough environmental review of the top RESA options for the South and Crosswind Runways and considered activities associated with construction and operation of the project.

IMPACT EVALUATION

Key environmental components were selected for evaluation based on ecological importance and value to the environment as well as relative social, cultural or economic importance. With mitigation measures in place, the project is not likely to cause significant adverse effects on any of the evaluation components including:

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

MITIGATION PLANS

The RESA Environmental Review recommends more than 50 mitigation measures to minimize or avoid potential environmental effects during construction and operation. An environmental supervisor will ensure that all mitigation measures are implemented and are effective.



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NOISE MANAGEMENT

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.

NOISE DURING CONSTRUCTION

Building RESAs on the South and Crosswind Runways is a multi-year project with summer runway closures required in 2015, 2016 and 2017. The North Runway will be used at night during these closures for up to four months each year. YVR will work to limit noise associated with the nightly use of the North Runway during construction of RESAs on the South Runway.

- Construction noise levels will be minimal during work on the South and Crosswind Runways and is not anticipated to be significantly perceptible to local area residents.
- It is not anticipated that Burkeville residents will hear noise due to RESA construction, as construction activities will not include noisy work such as pile driving.
- YVR will assess options to safely accommodate some operations on the South Runway during construction, wherever possible, as a means to reduce noise resulting from required night usage of the North Runway.
- For maximum efficiency during the runway closures, routine maintenance activities that occur every year on the South Airfield will be performed in conjunction with RESA work.
- Where possible, aircraft landings and takeoffs at night will occur over the Strait of Georgia (safety and wind permitting).

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NOISE MANAGEMENT

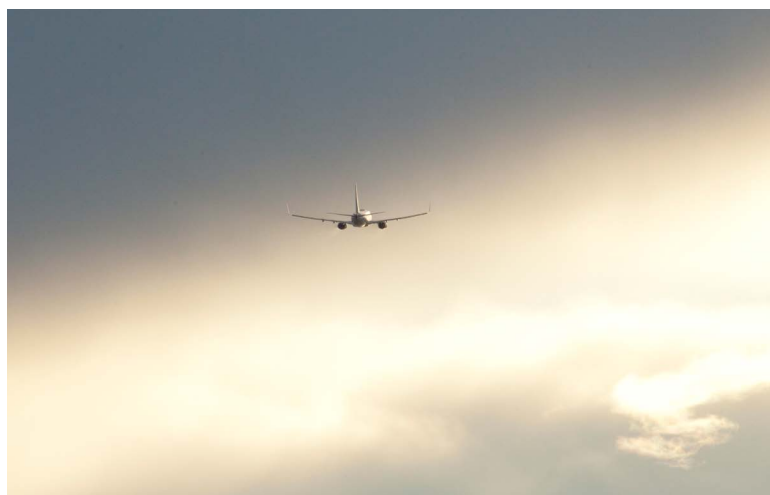
NOISE AFTER CONSTRUCTION

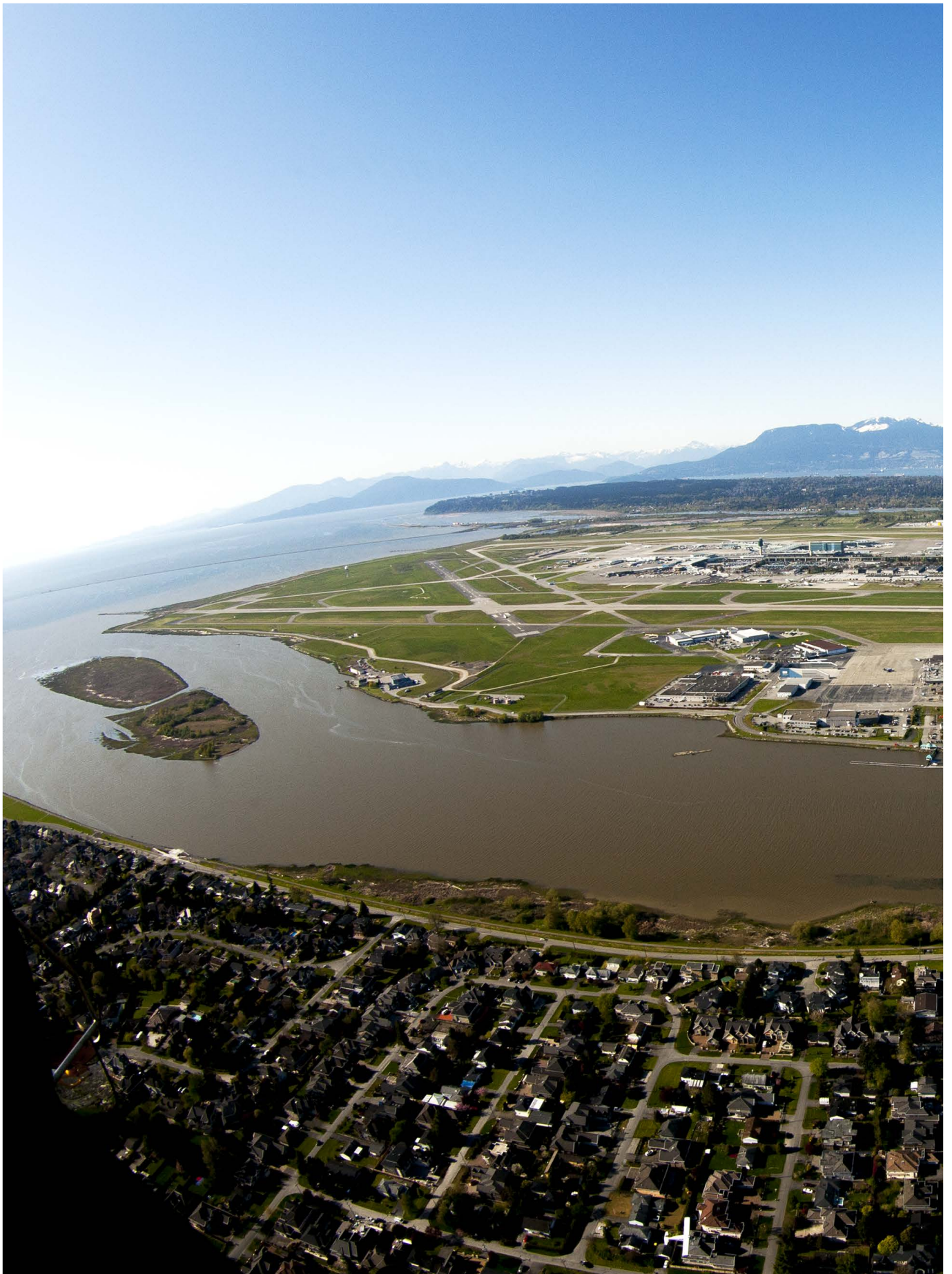
Minimal impacts to noise from ongoing aircraft activity are anticipated upon completion of RESAs on the South and Crosswind Runways.

- A limited number of aircraft may begin their takeoff roll at the east end of the South Runway, where new pavement will be added to facilitate RESA construction. This may result in a small increase in noise experienced in some areas of Burkeville; however, the use of reduced thrust takeoff procedures will mitigate noise exposure on this Sea Island community.
- YVR's Aeronautical Noise Management Committee will continue to provide a forum for community and industry stakeholders to discuss noise management at YVR.
- Vancouver Airport Authority maintains a network of 20 Noise Monitoring Terminals (NMTs) in the community. Data from these terminals is summarized in annual reports, which can be found on yvr.ca. Data from the NMT near Burkeville can be used to monitor and quantify any changes to noise levels associated with the RESA project.

NOISE CONCERNS?

- Email:
noise@yvr.ca
- Call:
604 207 7097





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CONSTRUCTION MILESTONES

Construction for RESAs on the South and Crosswind Runways will take three years (2015 to 2017).

CONSTRUCTION TIMELINE

ACTIVITY	2014			2015			2016			2017										
	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
MILESTONES																				
PLANNING AND DESIGN COMPLETION																				
CROSSWIND RUNWAY NORTH WEST END																				
CROSSWIND RUNWAY SOUTH EAST END																				
SOUTH RUNWAY WEST END																				
SOUTH RUNWAY EAST END																				

WHAT TO EXPECT

- YVR will provide regular construction updates to interested stakeholders.
- The majority of construction will take place during the summer months to take advantage of drier weather conditions and reduce the overall construction schedule.
- Anticipated noise levels will be comparable to what is experienced during YVR's routine summer South Runway closures.
- During the winter of 2015 and the spring of 2016, a pile of preload sand approximately 3.5 metres in height will be left at the end of the South Runway.



YVR's RESA Consultation

STAY INFORMED

YVR is committed to providing you with accurate and timely information about RESAs at YVR. Please let us know how best to keep you informed about South and Crosswind Runway RESA construction, as well as the upcoming North Runway RESA consultation process.

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:
RESAinfo@yvr.ca
- Website:
yvr.ca/resa

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