

The Six Ideas

Toronto Noise Mitigation Initiatives Public Consultation



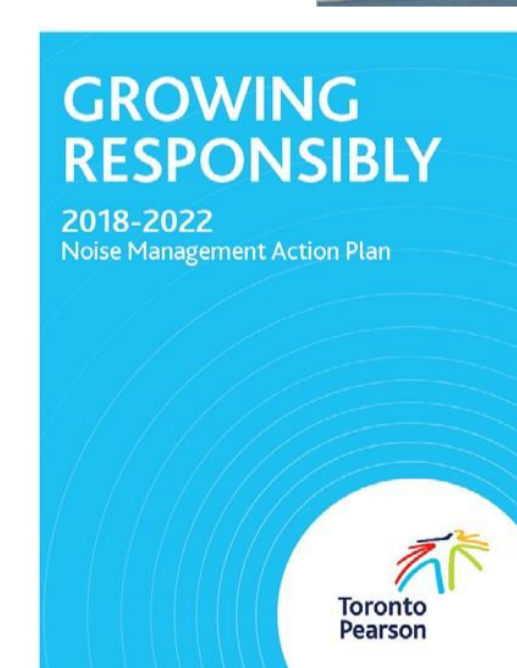
Presented by NAV CANADA & GTAA

Toronto Pearson 

Progress in Noise Mitigation

2017-2018

- GTAA releases report Toronto Pearson Residents' Reference Panel on Airport Growth and Noise Fairness
- Final report of the Independent Toronto Airspace Noise Review and NAV CANADA response
- GTAA launches 2018-2022 Noise Management Action Plan incorporating recommendations from the Noise Management Best Practices Report
- GTAA and NAV CANADA complete technical analysis of the Six Ideas



Background on the Six Ideas

In June 2015, in response to community feedback, the GTAA and NAV CANADA began a study of **six ideas** with the potential to **reduce the noise impact of Toronto Pearson's operations** on surrounding neighbourhoods.

Phase 1 (summer 2015): Stakeholder Roundtables

Phase 2 (2016 - 2017): Technical Analysis/Briefings

Phase 3 (winter 2018): Consultation on the Six Ideas

The Six Ideas



1. Nighttime Approaches.

Between 12:30 a.m. and 6:30 a.m., new flight paths will be used by arriving aircraft. The new routes will better avoid populated areas and impact fewer people and are optimized to allow aircraft to fly in quieter configuration associated with Continuous Descent Operations.



2. Nighttime Departures.

Between 12:30 a.m. and 6:30 a.m., nighttime departure route changes will better avoid populated areas and impact fewer people. This includes changes to where aircraft turn. This change in nighttime departures may help minimize the population impacted by aircraft noise during this time.



3. Increase Downwind Speed.

Effective April 2017, changes in speed restrictions on the downwind portion of the arrival flight path were implemented. This change is designed to reduce noise in some areas of the city by decreasing the need for flap use by pilots of larger aircraft needing to slow their airspeed as they approach the airport.

The Six Ideas



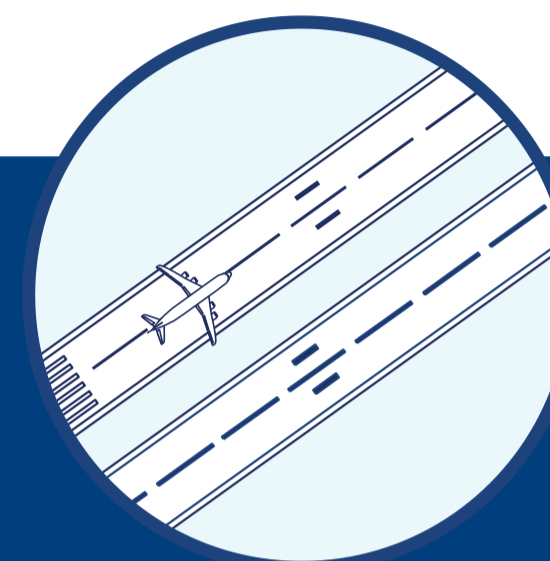
4. Continuous Descent Operations.

Increasing the use of Continuous Descent Operations enables aircraft to be at higher altitudes during a longer portion of the arrival. It also enables more aircraft to operate in a clean, quieter profile at a reduced thrust and flap setting. In some cases, the proposal will allow for more aircraft to cut across Lake Ontario and avoid using the downwind leg.



5. Summer Weekend Runway Alternation Program.

Many international airports operate programs designed to provide residents with predictable respite from aircraft noise by rotating runway usage during low traffic periods. This program would provide residents under the final approach and initial departure paths of the east/west runways with predictable respite on summer weekends.



6. Preferential Runway System Review.

Toronto Pearson uses a preferential runway system from midnight to 6:30 a.m. in order to minimize impacts on residential areas. Proposed changes will further minimize the population affected by nighttime aircraft noise and provide residents with more clarity on which runways will be used in which weather conditions.

Airport Growth

Our region is growing and so is demand for air travel

The GTA population is expected to grow about **1.4 per cent annually for the next 20 years**. This regional growth is, in turn, part of a worldwide trend that will see global air travel nearly double to 14 billion passengers by 2029, according to Airports Council International.



\$1.0 Trillion

Ontario GDP by 2043



~15.5 Million

Population by 2043

Projections for 2037

2016

44.3 M

passengers

456,000

total aircraft movements

108

passengers/passenger aircraft movement

450,000

tonnes of cargo

2037

85 M

passengers

632,000

total aircraft movements

140

passengers/passenger aircraft movement

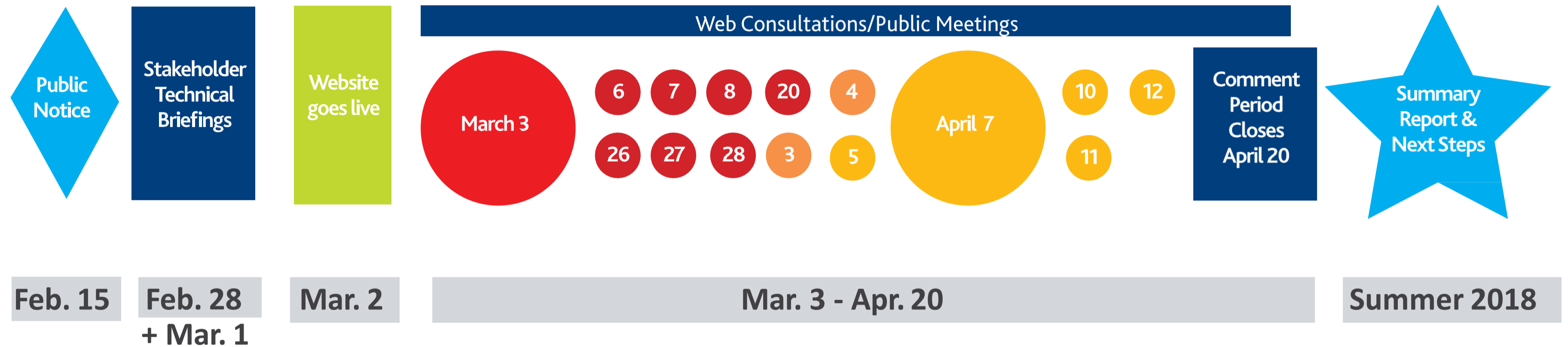
968,000

tonnes of cargo

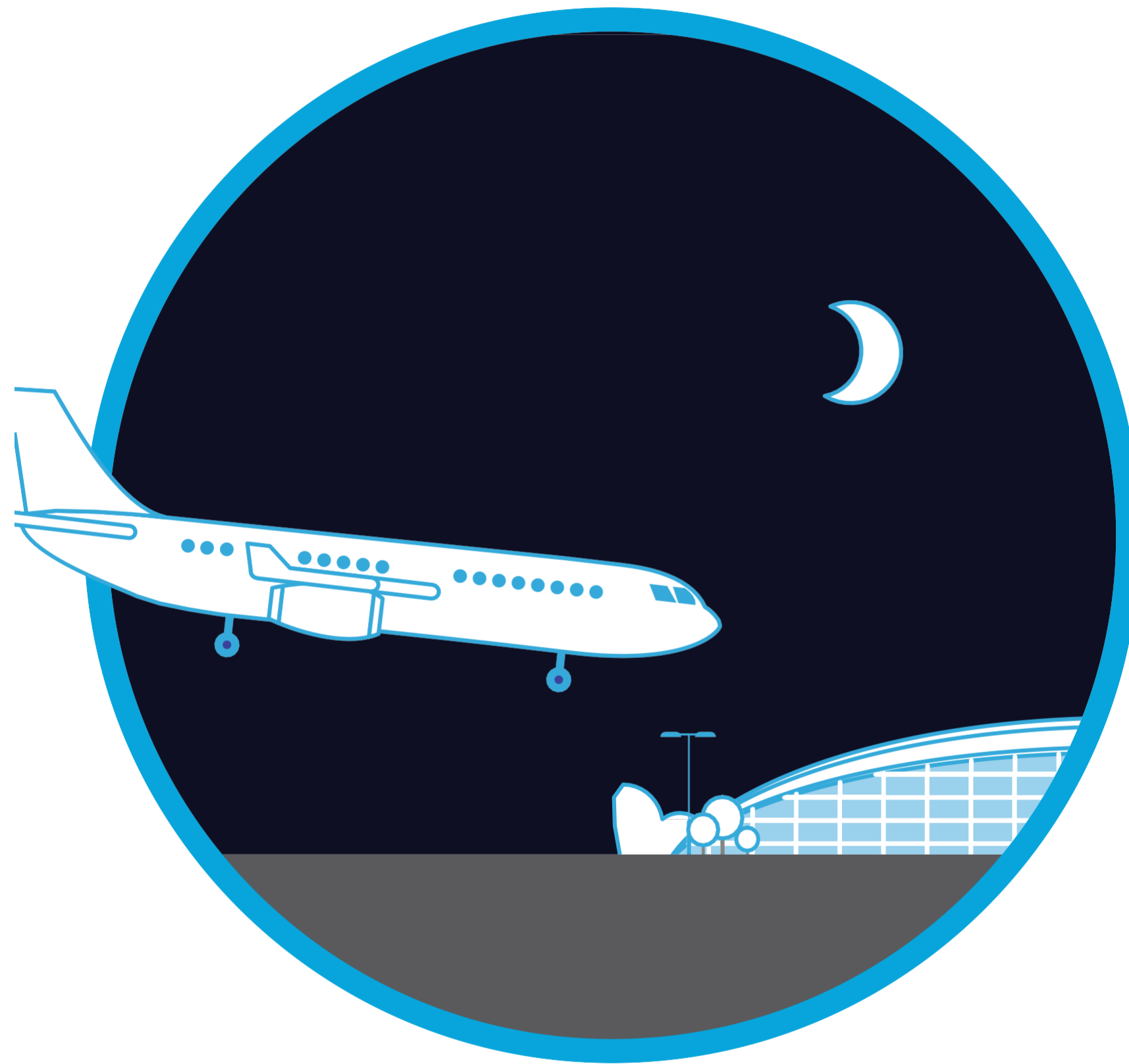


Toronto Pearson

Consultation Times



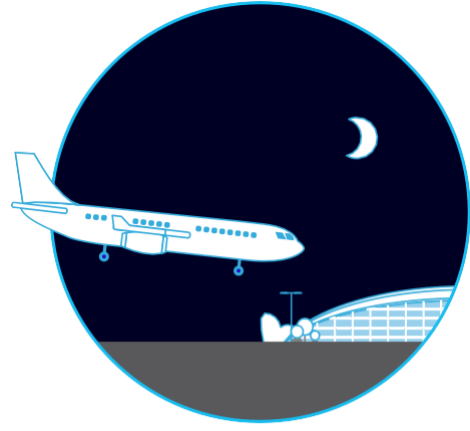
For more information visit torontopearson.com/conversations



Idea 1

Nighttime Approaches.

Between 12:30 a.m. and 6:30 a.m., new flight paths will be used by arriving aircraft. The new routes will better avoid populated areas and impact fewer people and are optimized to allow aircraft to fly in quieter configuration associated with Continuous Descent Operations.



New Nighttime Approach Procedures

What we are proposing

The implementation of new night time approaches that better avoid residential areas.

Why is this being proposed?

Lower demand and fewer aircraft in Toronto Pearson's airspace at night provide the opportunity to employ routes that better avoid populated areas and impact fewer people. In addition, the approaches are optimized to allow aircraft to fly in a quieter configuration associated with continuous descent operations.

When would this be used?

Nighttime approaches will be used between the hours of 12:30 a.m. and 6:30 a.m. If possible, usage would start earlier, however use will be limited to very low traffic periods overnight. They require relatively low traffic levels to be operationally feasible; spikes in traffic increase complexity and require other approach types to be used.

What are the benefits?

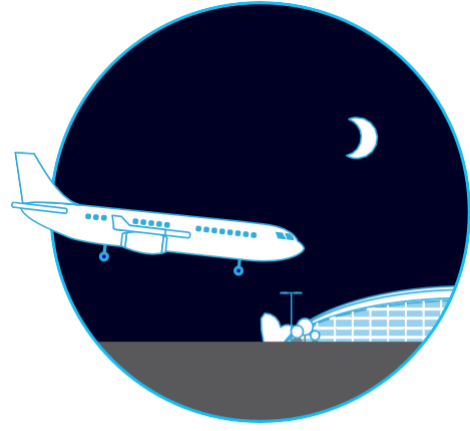
The new procedures will be designed to enable continuous descent and therefore will place aircraft higher on portions of the approach. They have been designed to reduce fly over of residential areas where possible in order to reduce the number of households overflowed. Noise modelling analysis shows reductions in population overflowed of up to 44 per cent depending on the approach.



The light blue line below shows an example arrival using a downwind leg, with residential areas circled in yellow. These will be avoided when an aircraft employs the proposed approach (black).



The continuous descent profile of the proposed flight path will see aircraft at higher altitudes.



New Nighttime Approach Procedures

Runway 05



Above: Map shows a six hour traffic sample of nighttime operations.



Above: Map shows the modeled noise footprint of an aircraft (737-800) flying the approaches. Noise analysis suggests that 29,000 fewer people will be affected by noise levels >60dBA from overnight flights when Runway 05 is in use. This represents a reduction by as much as 22 per cent depending on transition flown.

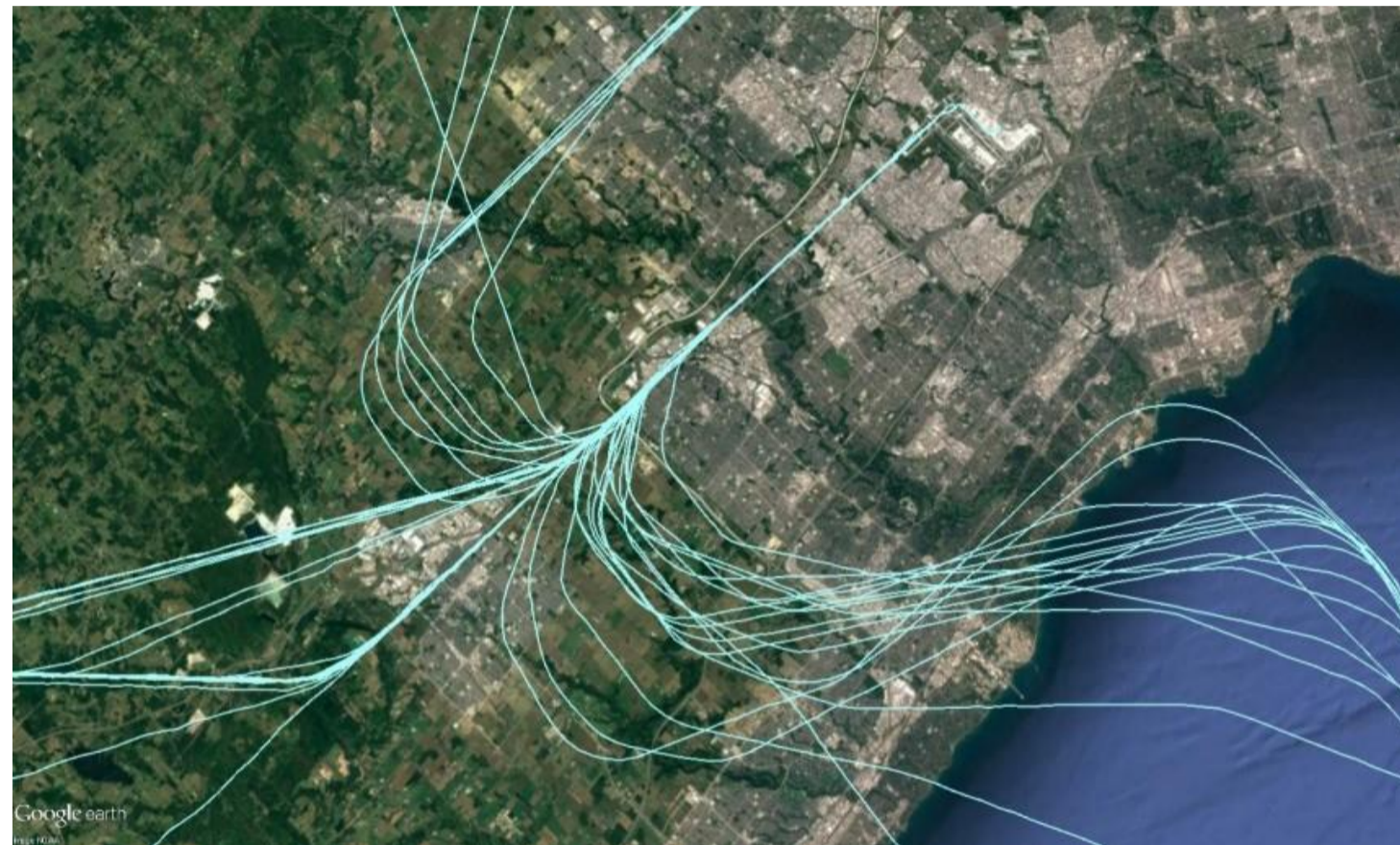


Left: Map shows composite proposed approaches to Runway 05 in black; shaded areas show where there is expected to be some traffic distribution prior to joining the procedure. Aircraft icons show the approximate altitude on points along the procedure.

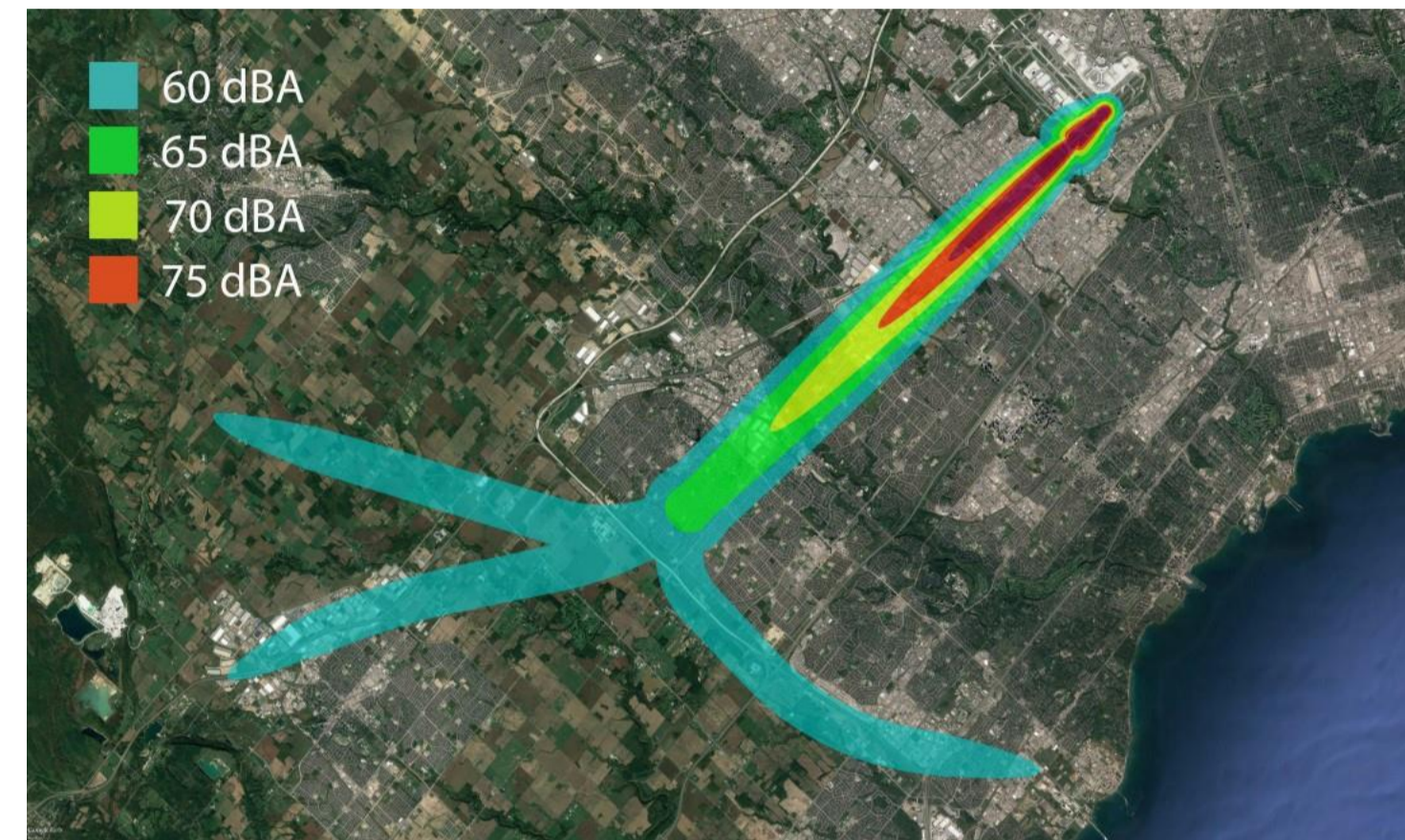


New Nighttime Approach Procedures

Runway 06L



Above: Map shows a six hour traffic sample of nighttime operations.



Above: Map shows the modeled noise footprint of an aircraft (737-800) flying the approaches. Noise analysis suggests that 34,000 fewer people will be affected by noise levels >60dBA from overnight flights when Runway 06L is in use. This represents a reduction by as much as 30 per cent depending on transition flown. It should be noted that 06L is not a nighttime preferential runway and usage of this runway at night will be low.

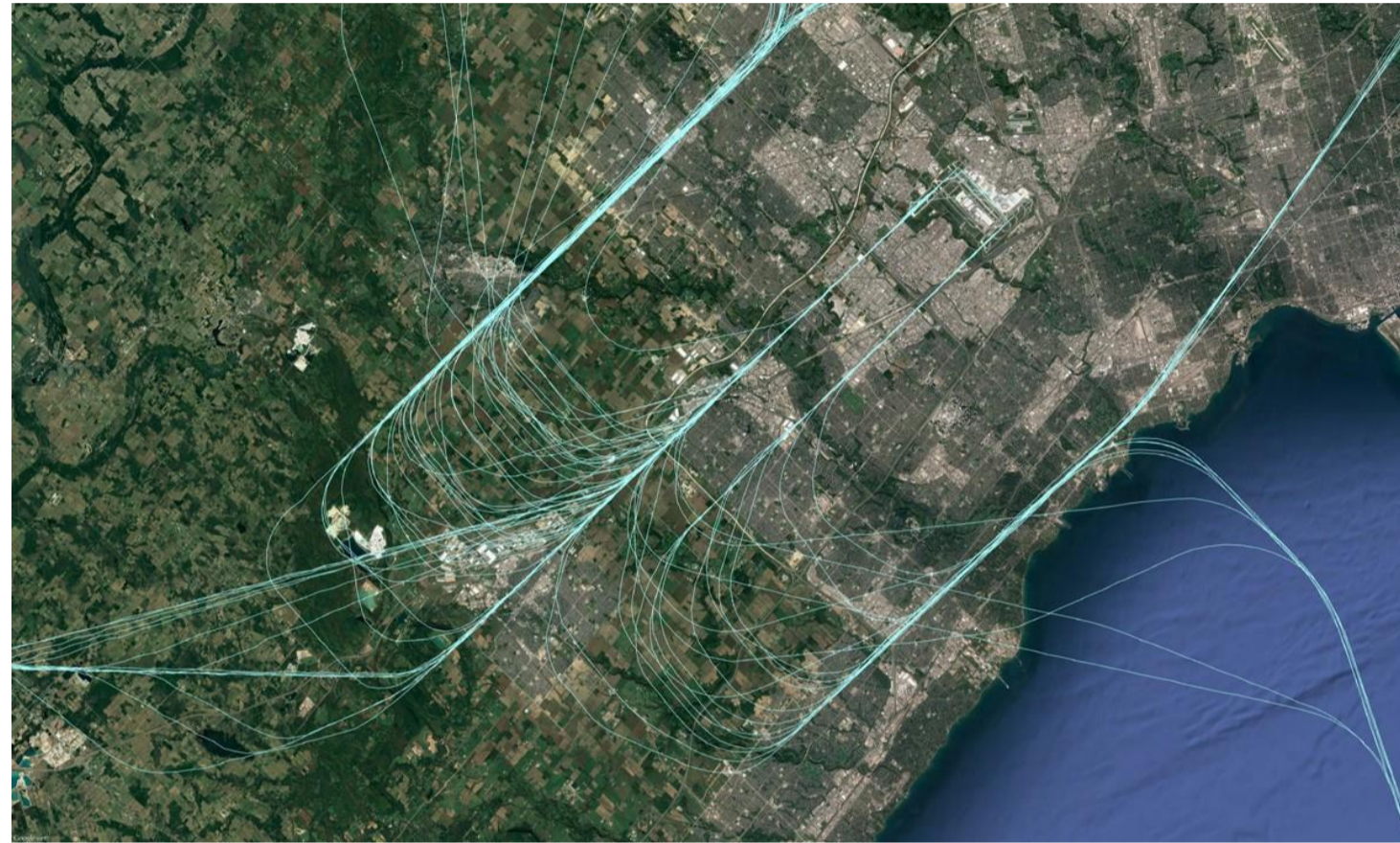


Left: Map shows the composite proposed approaches to Runway 06L in black; shaded areas show where there is expected to be some traffic distribution prior to joining the procedure. Aircraft icons show the approximate altitude on points along the procedure.

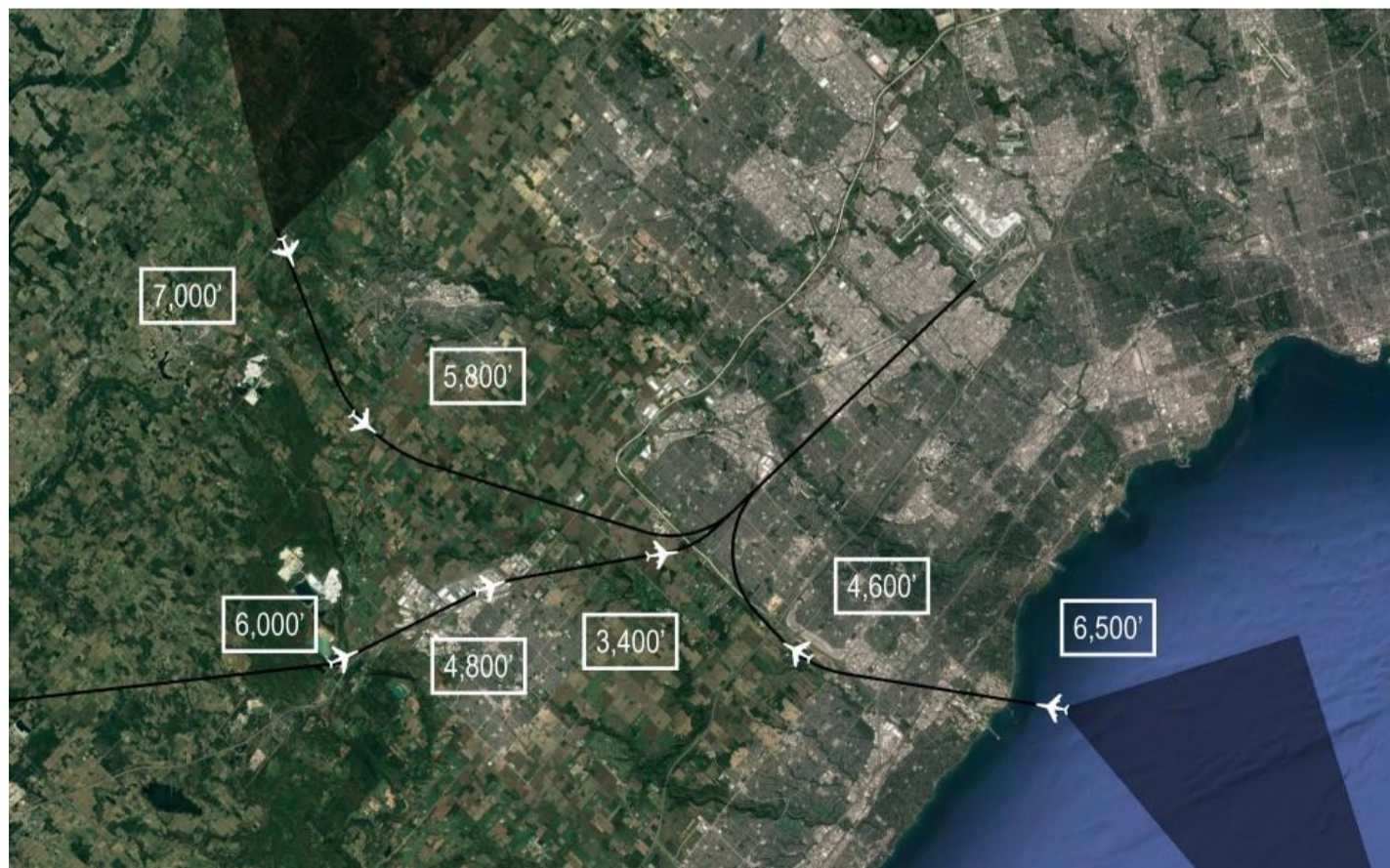


New Nighttime Approach Procedures

Runway 06R



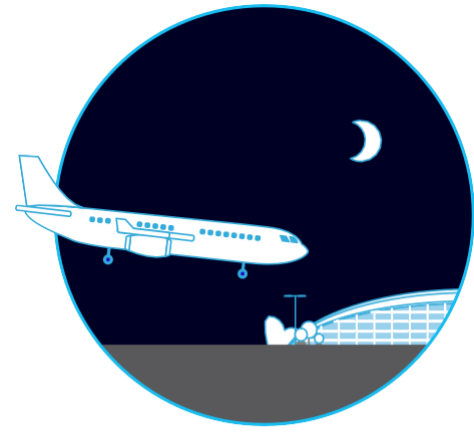
Above: Map shows a six hour traffic sample of nighttime operations.



Left: Map shows the composite proposed approaches to runway 06R in black; shaded areas show where there is expected to be some traffic distribution prior to joining the procedure. Aircraft icons show the approximate altitude on points along the procedure.

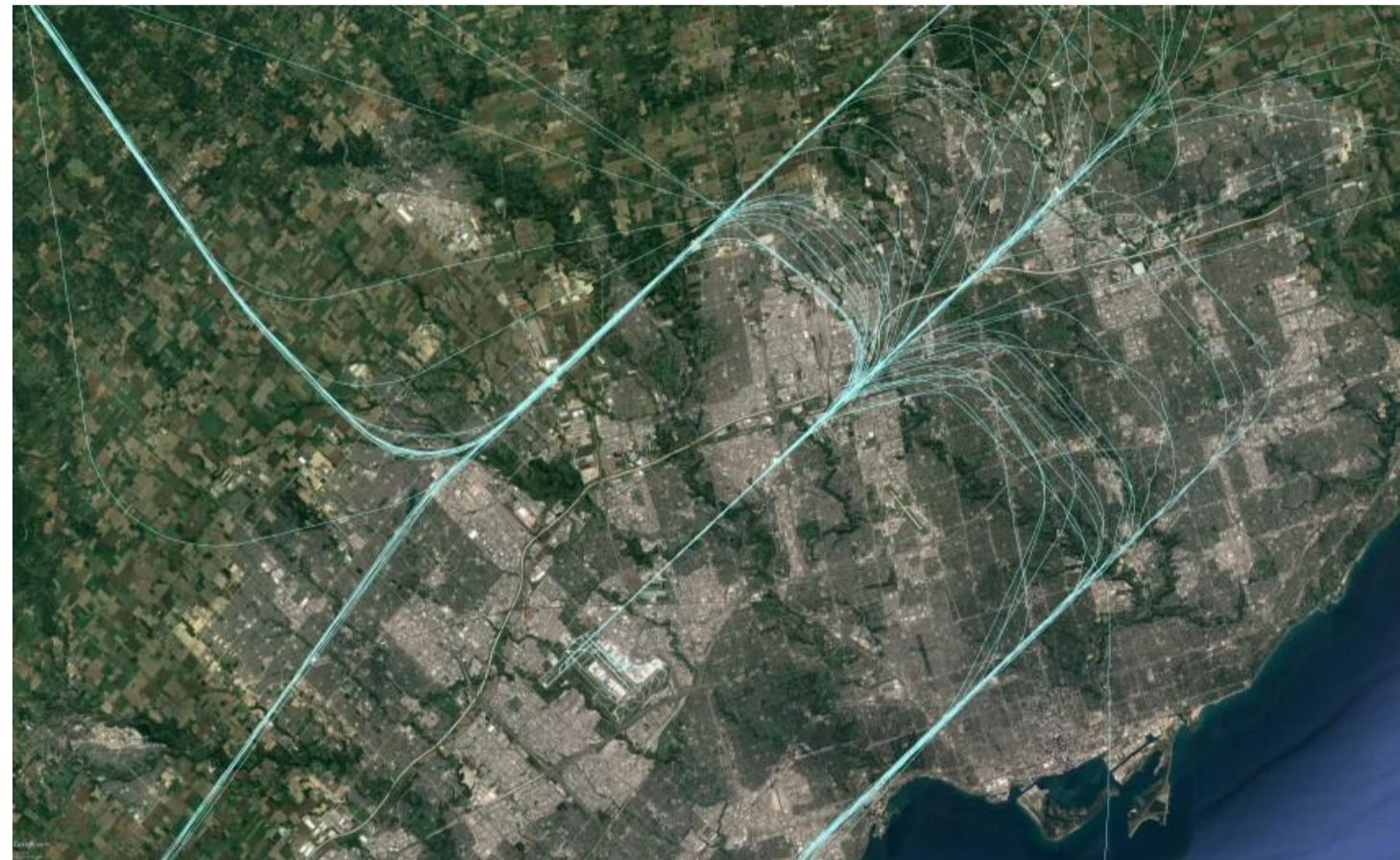


Above: Map shows the modeled noise footprint of an aircraft (737-800) flying the approaches. Noise analysis suggests that 34,000 fewer people will be affected by noise levels >60dBA from overnight flights when Runway 06R is in use. This represents a reduction by as much as 30 per cent depending on transition flown. It should be noted that 06R is not a nighttime preferential runway and usage of this runway at night will be low.

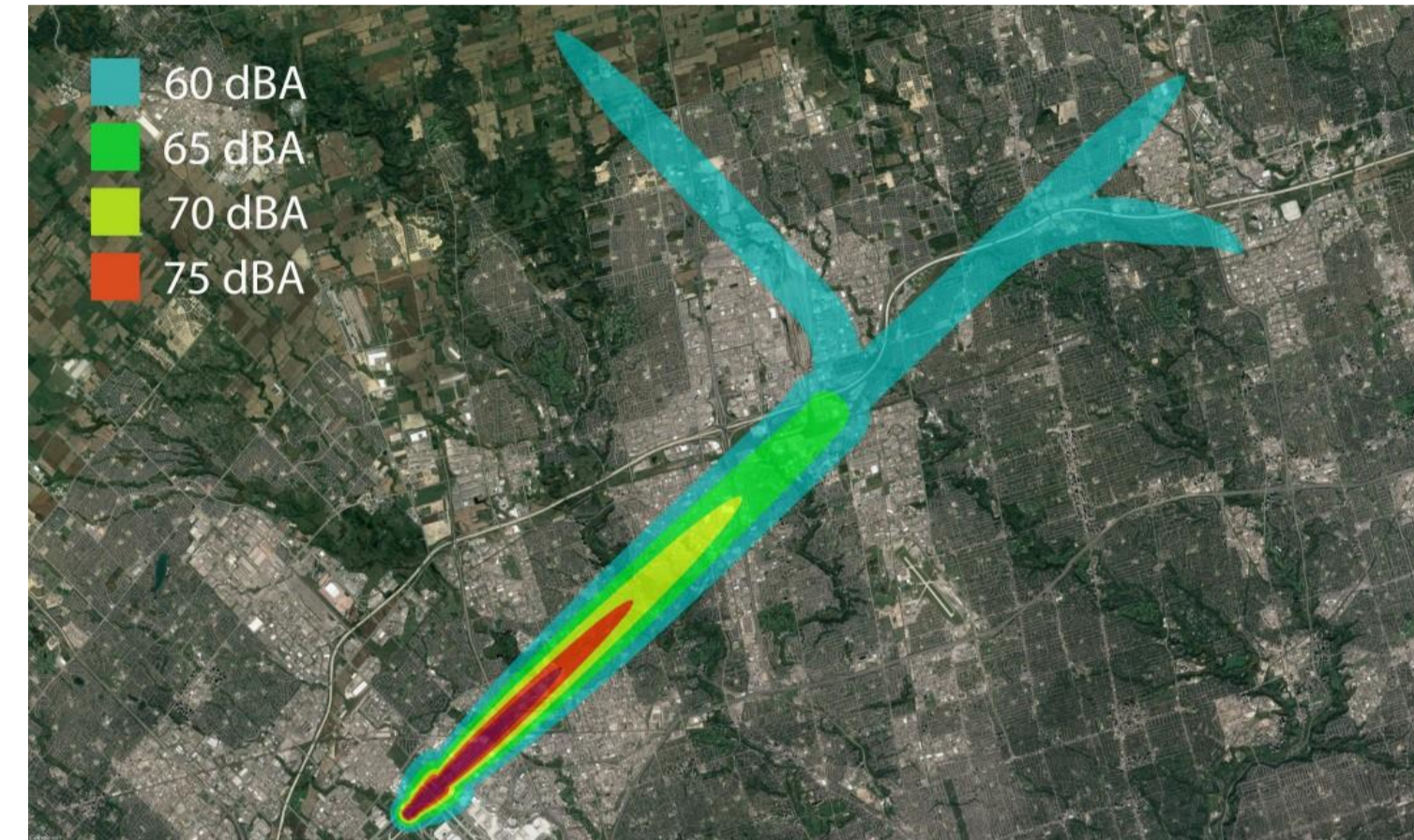


New Nighttime Approach Procedures

Runway 23



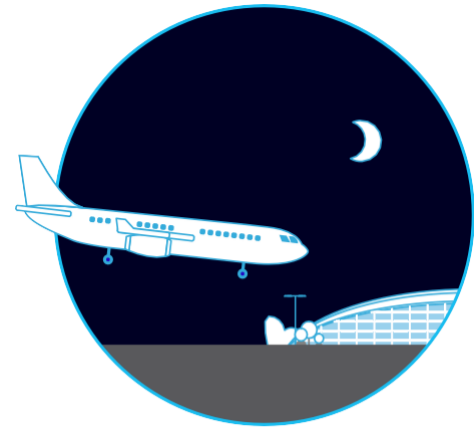
Above: Map shows a six hour traffic sample of nighttime operations.



Above: Map shows the composite proposed approaches to runway 23 in black; shaded areas show where there is expected to be some traffic distribution prior to joining the procedure. Aircraft icons show the approximate altitude on points along the procedure.

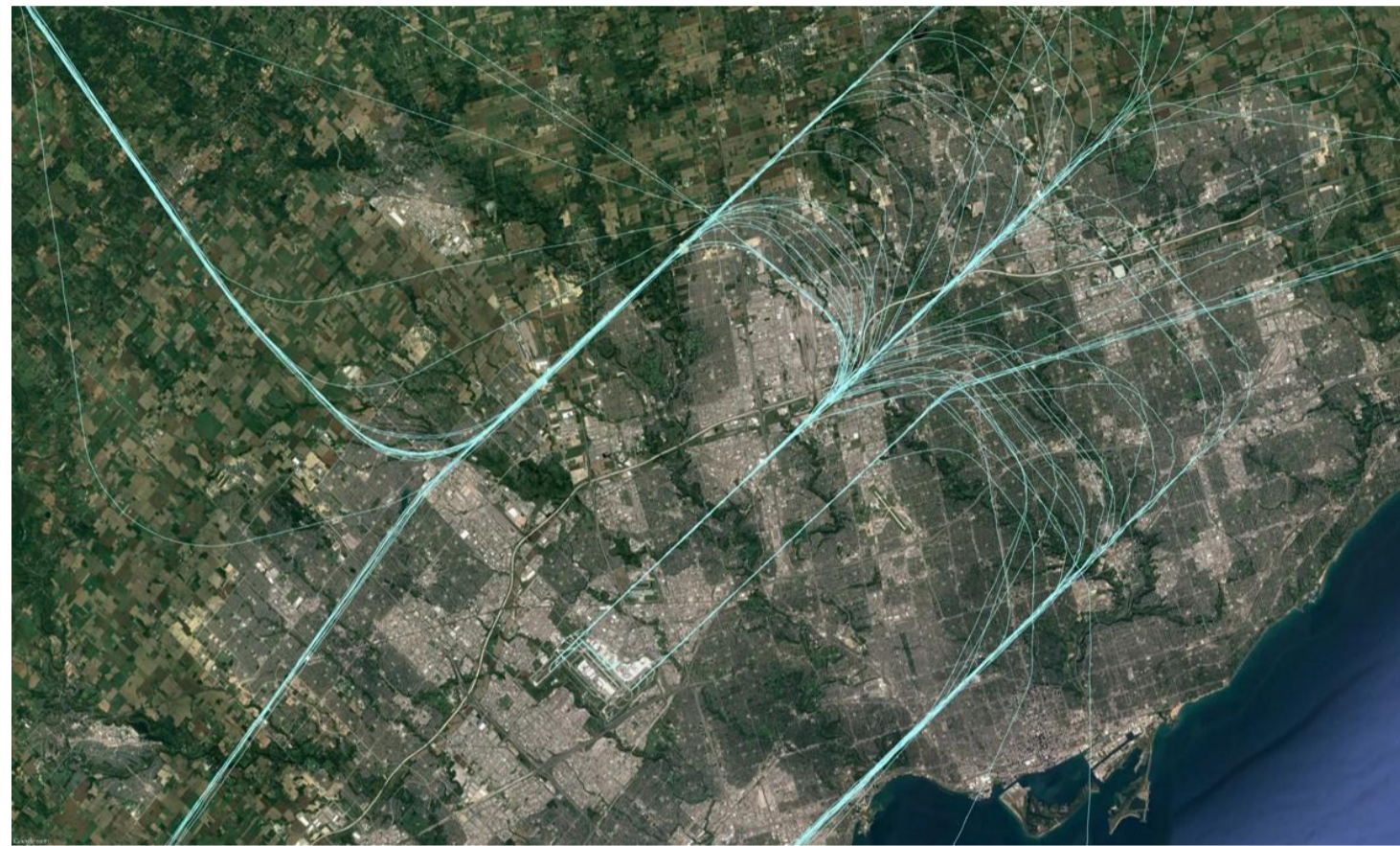


Left: Map shows the composite proposed approaches to runway 23 in black; shaded areas show where there is expected to be some traffic distribution prior to joining the procedure. Aircraft icons show the approximate altitude on points along the procedure.

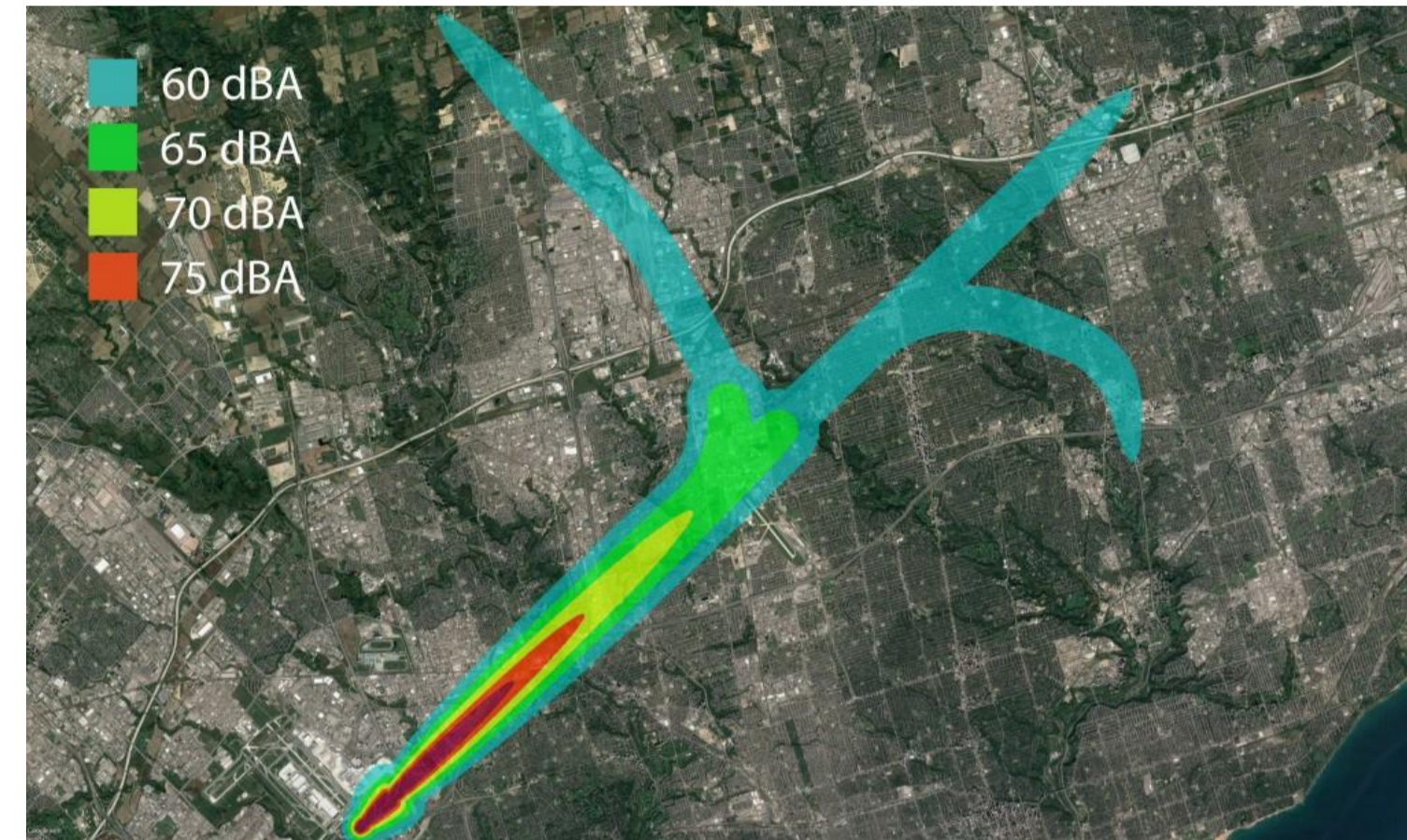


New Nighttime Approach Procedures

Runway 24L



Above: Map shows a six hour traffic sample of nighttime operations.



Above: Map shows the modeled noise footprint of an aircraft (737-800) flying the approaches. Noise analysis suggests that 130,000 fewer people will be affected by noise levels >60dBA from overnight flights when Runway 24L is in use. This represents a reduction by as much as 41 per cent depending on transition flown. It should be noted that 24L is not a nighttime preferential runway and usage of this runway at night will be low.

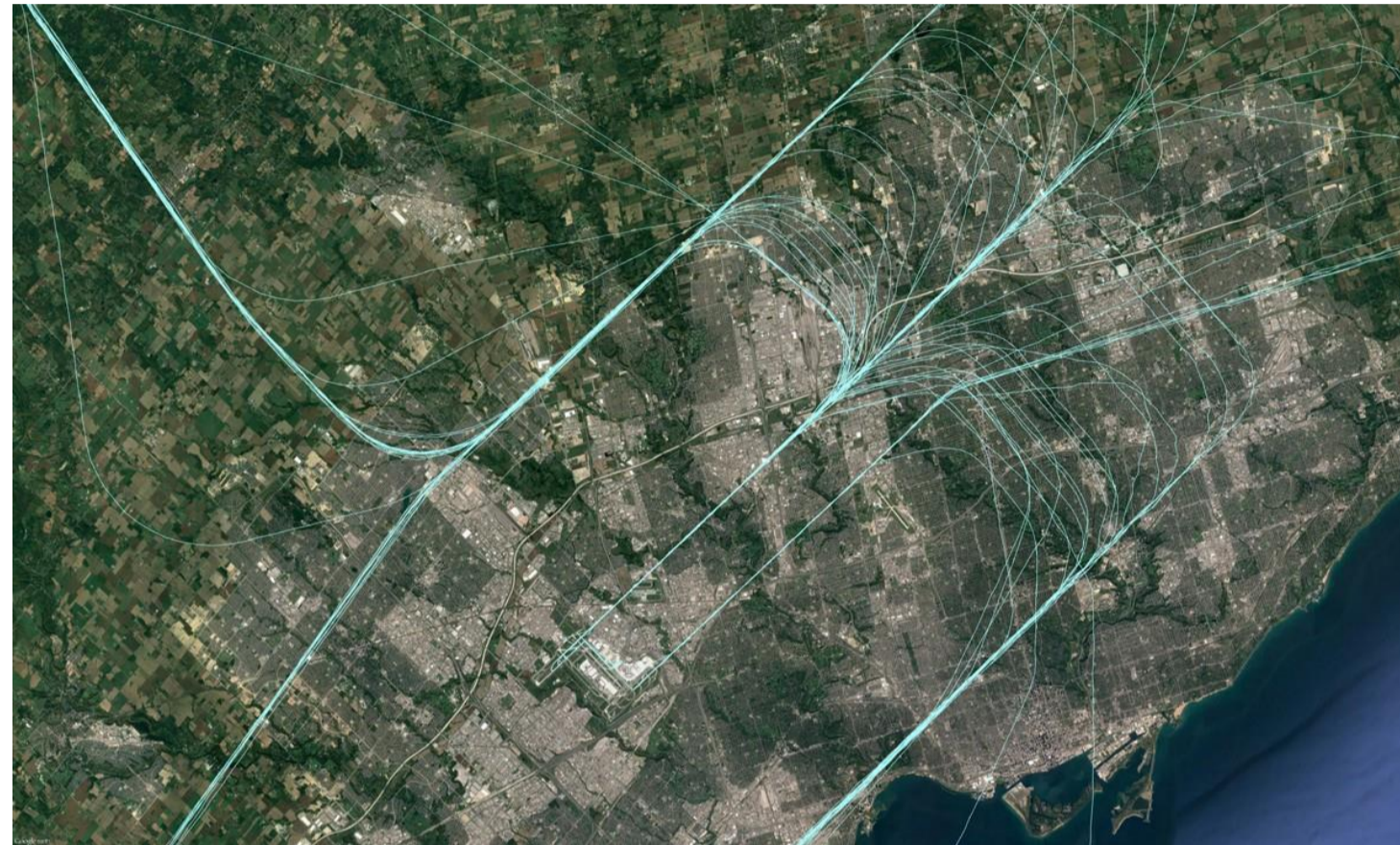


Above: Map shows the composite proposed approaches to runway 24L in black; shaded areas show where there is expected to be some traffic distribution prior to joining the procedure. Aircraft icons show the approximate altitude on points along the procedure.

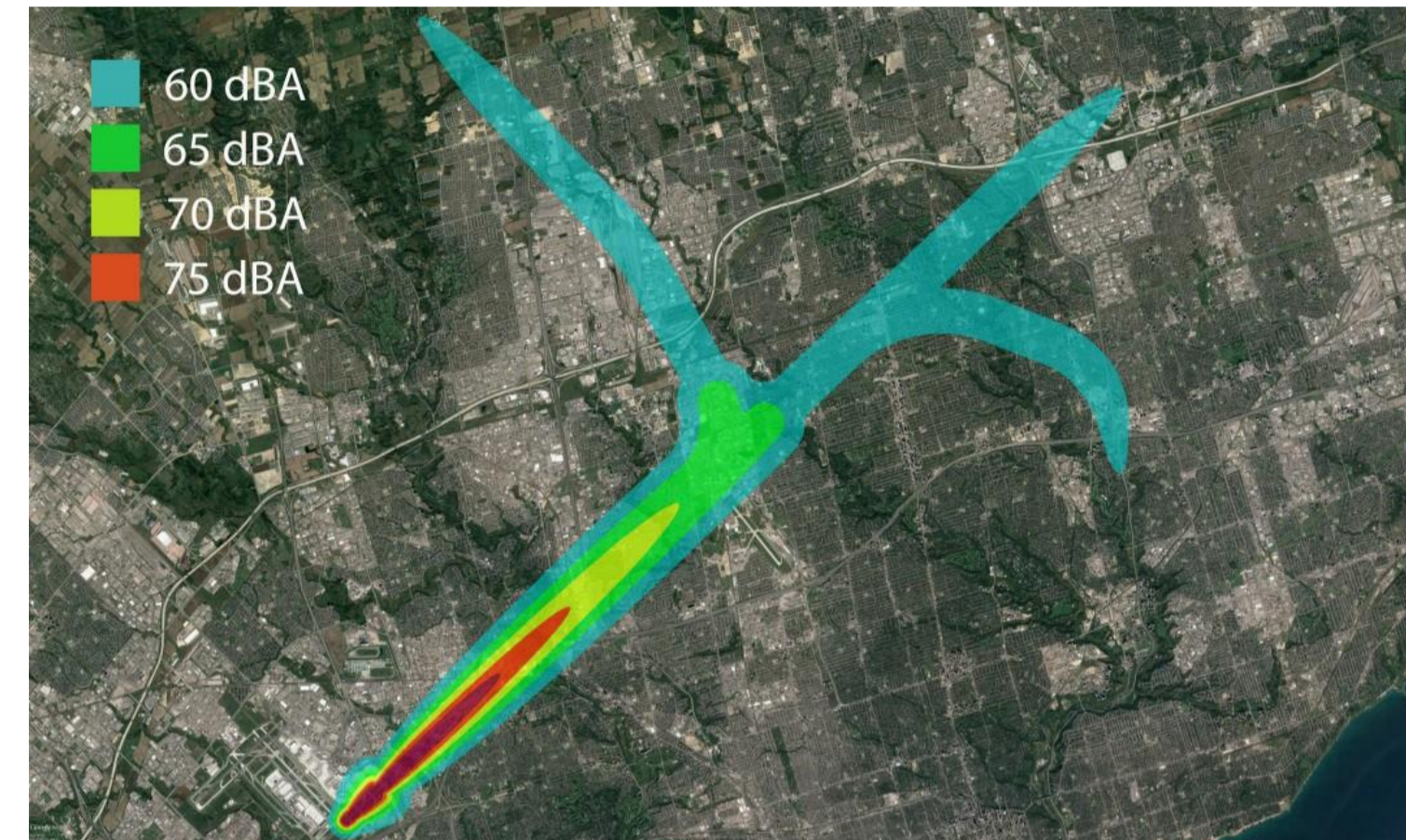


New Nighttime Approach Procedures

Runway 24R



Above: Map shows a six hour traffic sample of nighttime operations.



Above: Map the modeled noise footprint of an aircraft (737-800) flying the approaches. Noise analysis suggests that 130,000 fewer people will be affected by noise levels >60dBA from overnight flights when Runway 24R is in use. This represents a reduction by as much as 41 per cent depending on transition flown. It should be noted that 24R is not a nighttime preferential runway and usage of this runway at night will be low.



Above: Map shows the composite proposed approaches to runway 24R in black; shaded areas show where there is expected to be some traffic distribution prior to joining the procedure. Aircraft icons show the approximate altitude on points along the procedure.



Idea 2

Nighttime Departures.

Between 12:30 a.m. and 6:30 a.m., nighttime departure route changes will better avoid populated areas and impact fewer people. This includes changes to where aircraft turn. This change in nighttime departures may help minimize the population impacted by aircraft noise during this time.



New Nighttime Departure Procedures

What we are proposing

The implementation of new nighttime departure procedures that better avoid residential areas.

Why is this being proposed?

Lower demand and fewer aircraft in Toronto Pearson's airspace at night provide the opportunity to employ departure procedures that better avoid populated areas and impact fewer people.

How is this being done?

NAV CANADA is proposing a mix of strategies to provide better departure routings. These include changing the location where aircraft turn towards their destination – either by increasing the required altitude they must reach before turning, or identifying an optimized location for their turn – and, in some cases, altering current headings.

When would it be used?

Nighttime departure procedures will be used between the hours of 12:30 a.m. and 6:30 a.m. If possible, usage would start earlier in the evening, but use is limited to low traffic periods.

What are the benefits?

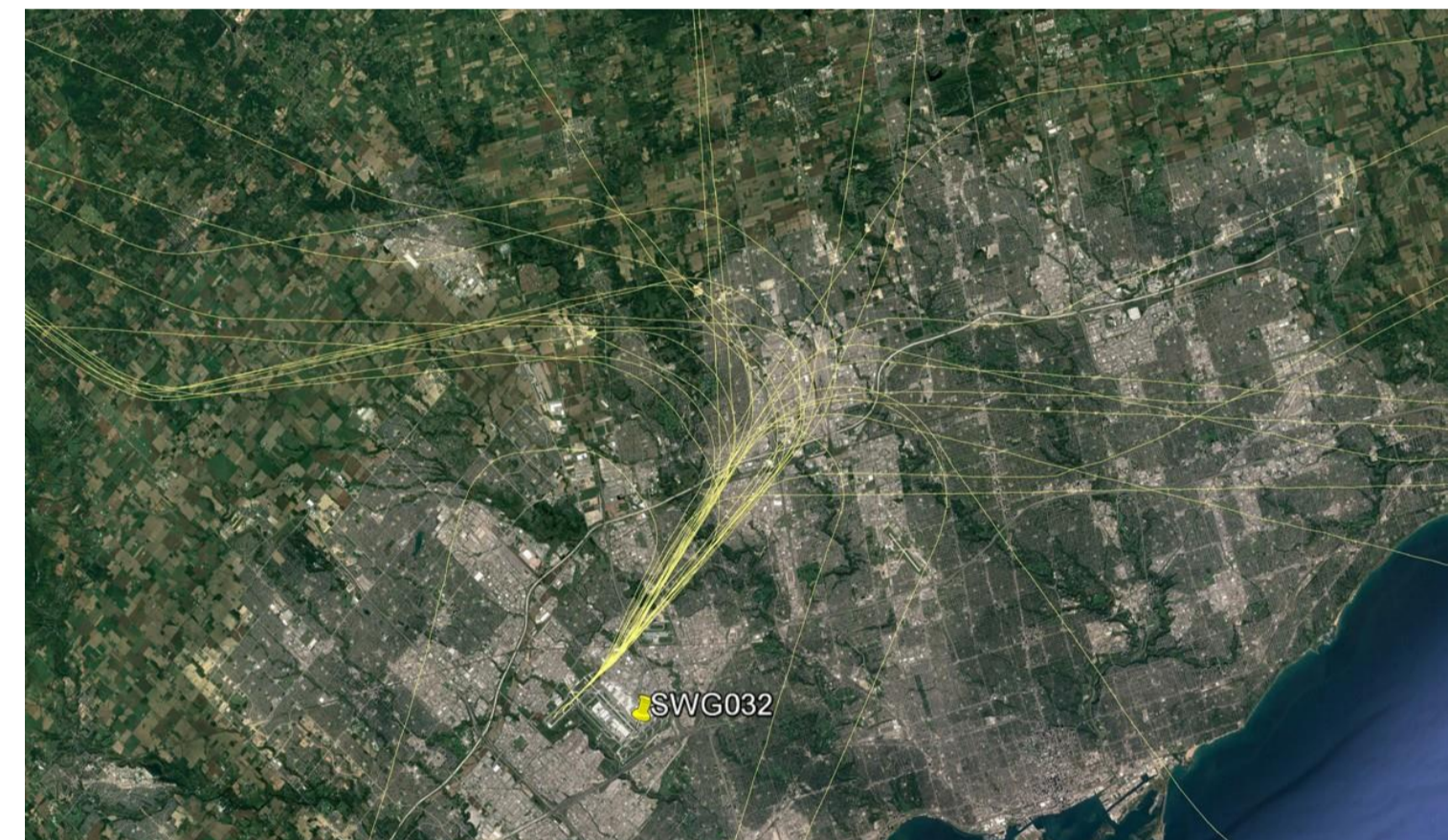
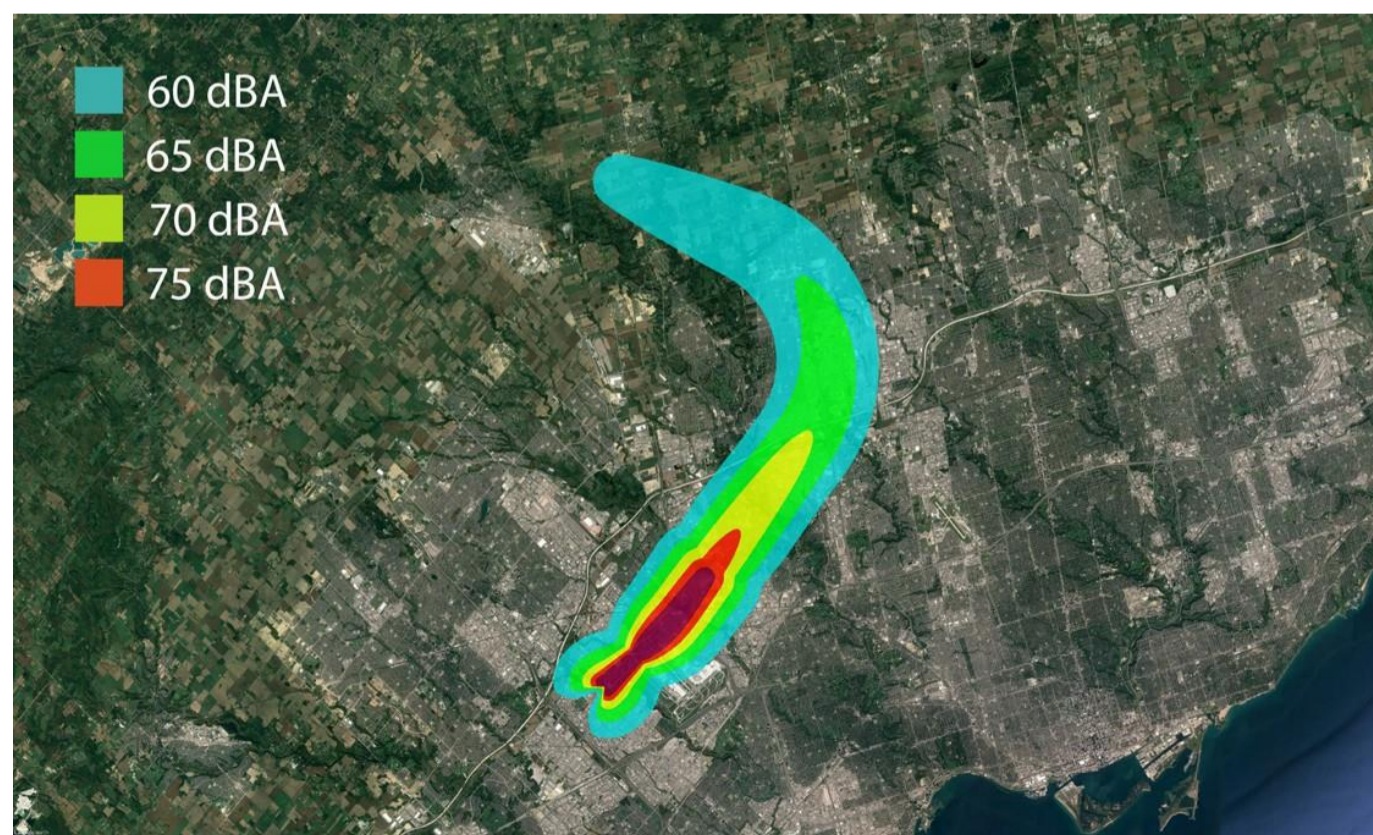
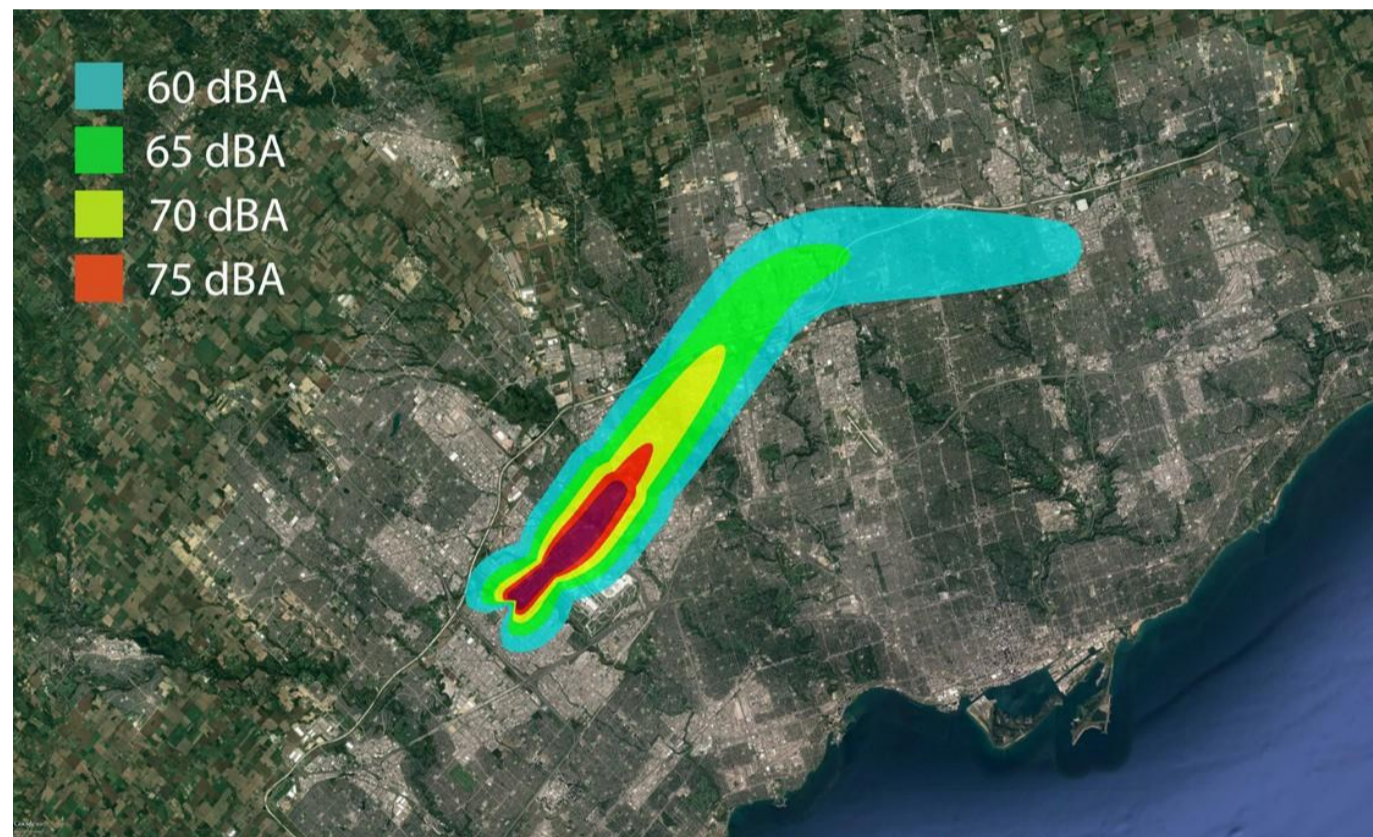
Overall, the proposed nighttime departure procedures reduce the number of residents overflown,
by as much as 39% for some departures.



New Nighttime Departure Procedures

Runway 05

The proposed changes for nighttime departures off of runway 05 consist of climbing on a 10 degree divergence from runway heading until the aircraft reaches 5,000 feet prior to being directed on course. This procedure targets overflight of commercial/industrial use lands when the aircraft is lowest and, therefore, the loudest. Once at the targeted attitude, aircraft will fan out in the same manner that they do today.



Above: Map shows a sample of nighttime departures over two nights.

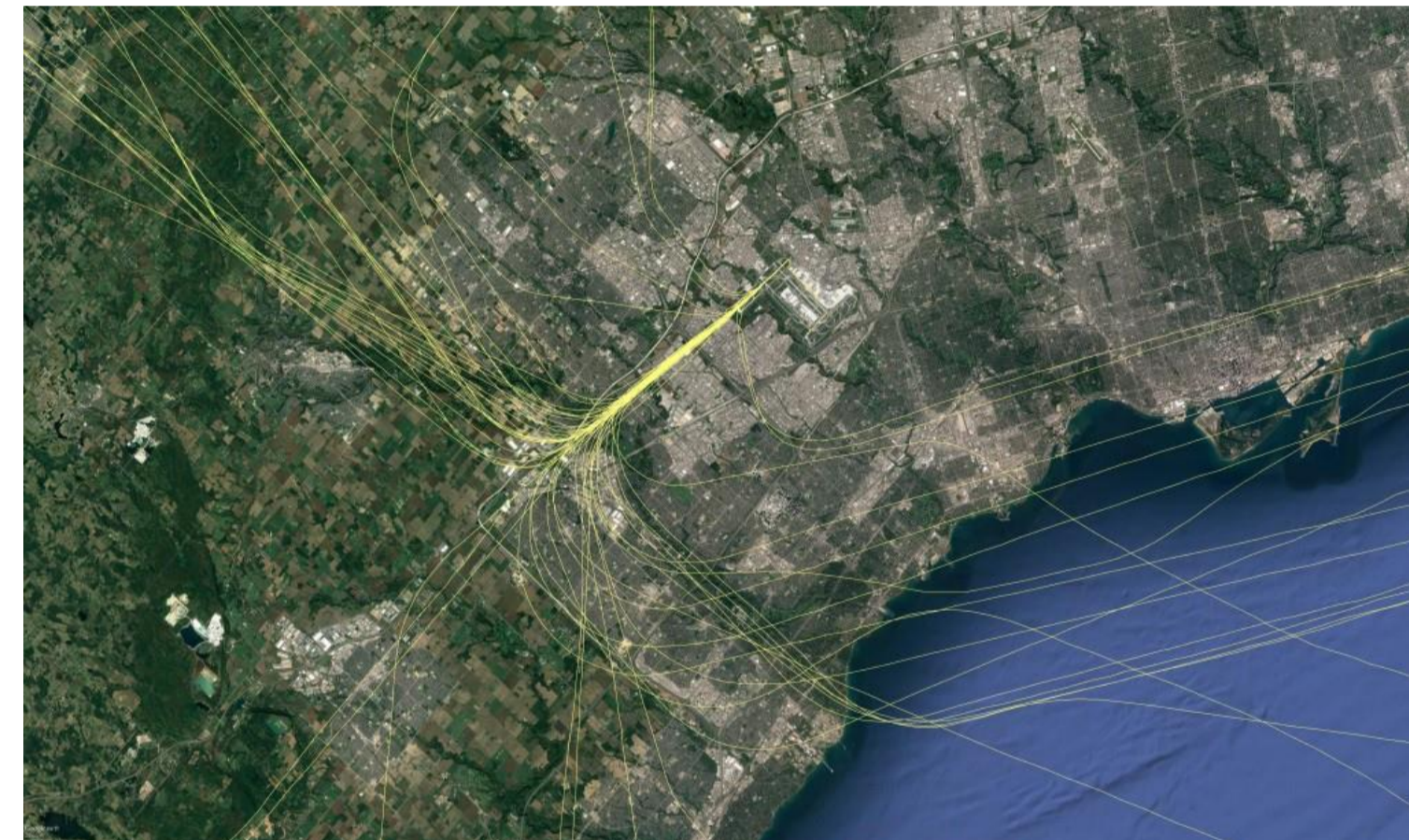
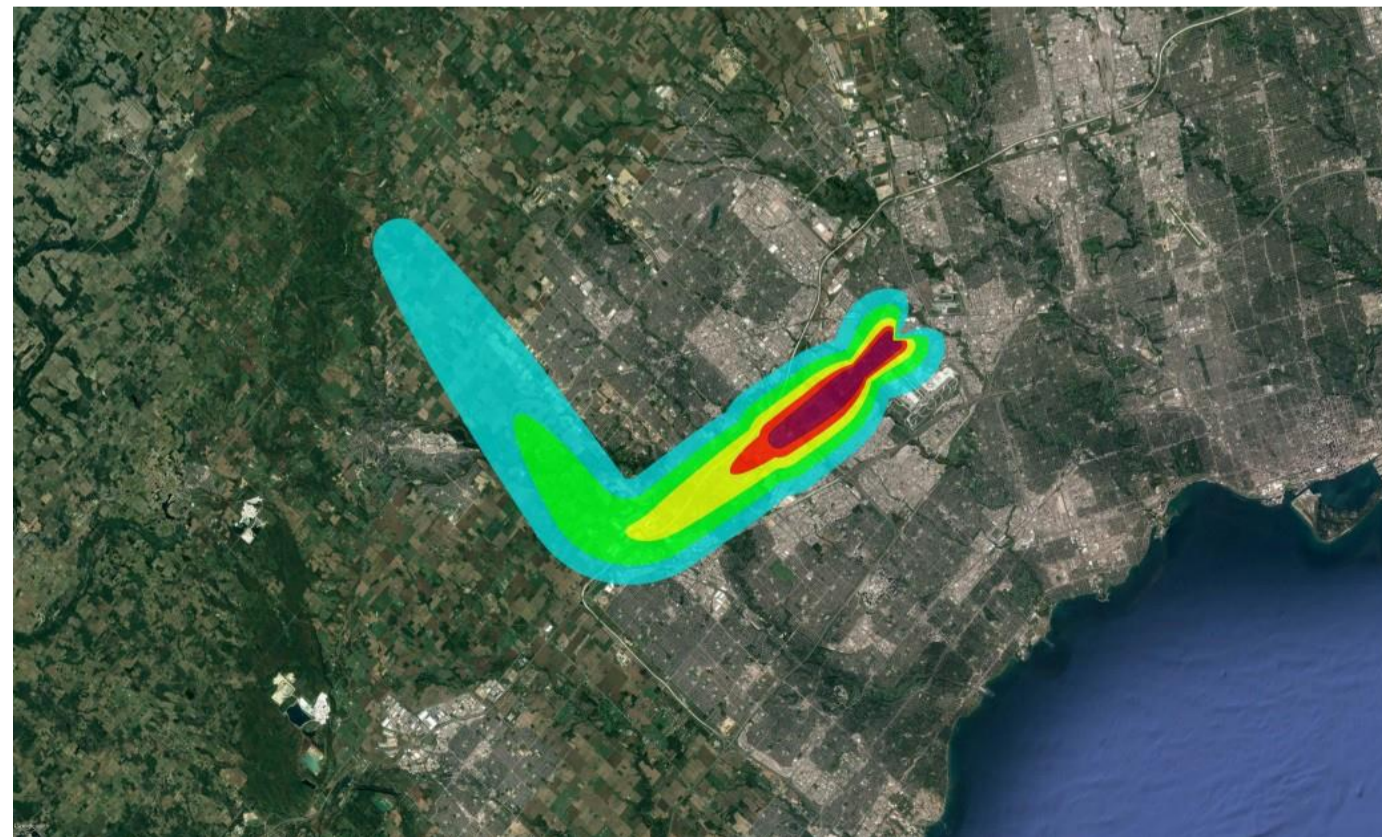
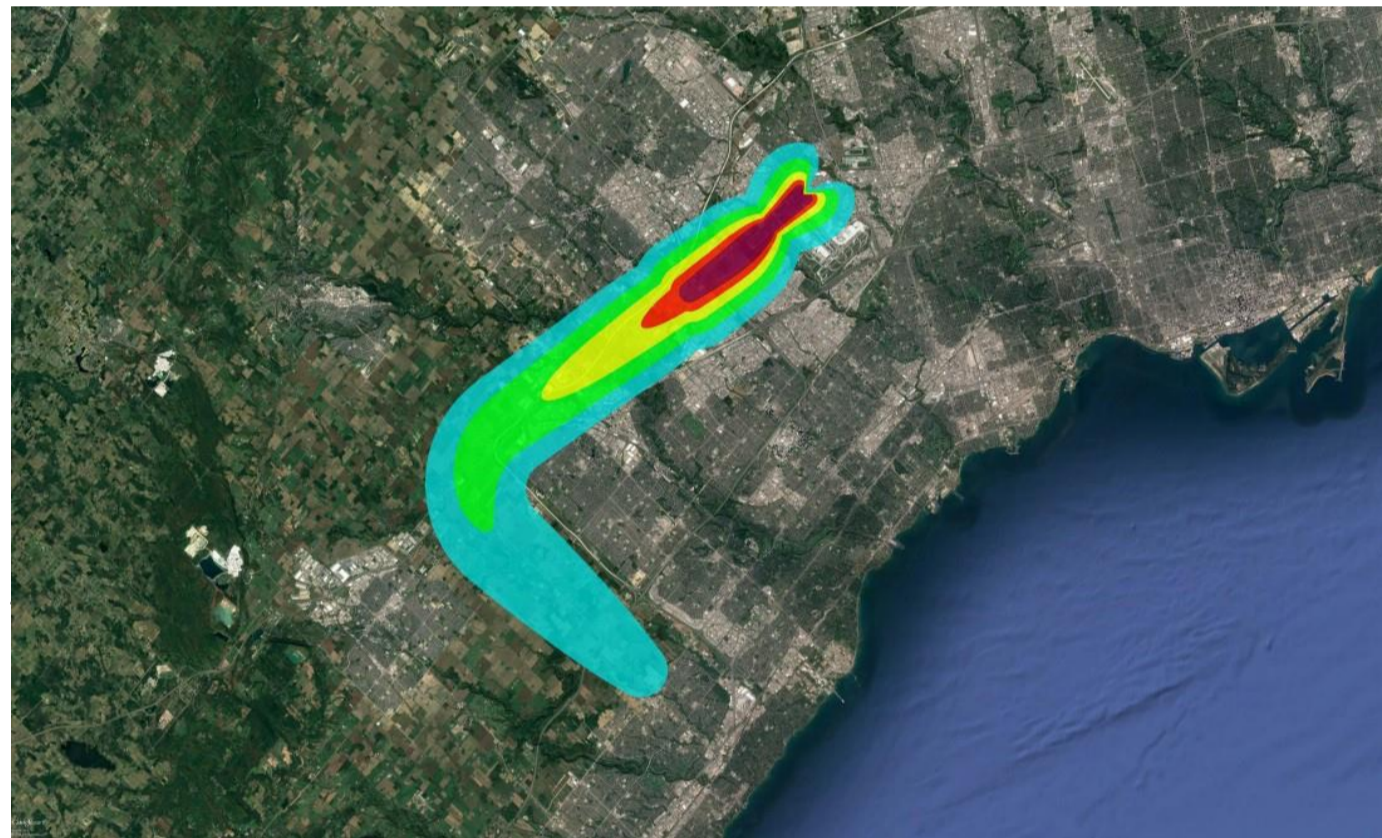
Left: Maps show the modeled noise footprint of an aircraft (737-800) flying the departures. Noise analysis suggests that as many as 172,000 fewer people will be affected by noise levels >60dBA from overnight flights when Runway 05 is in use. This represents a reduction by as much as 39 per cent depending on the subsequent heading.



New Nighttime Departure Procedures

Runway 23

The proposed changes for nighttime departures off of runway 23 consist of climbing on a 10 degree divergence from runway heading and delaying turns north or south until past the boundaries of communities to the immediate west of the airport. This procedure targets overflight of agricultural use lands when the aircraft is lowest and, therefore, the loudest. Once at the targeted location, aircraft will fan out in the same manner that they do today.



Above: Map shows a sample of nighttime departures over two nights.

Left: Maps show the modeled noise footprint of an aircraft (737-800) flying the departures. Noise analysis suggests that as many as 220,000 fewer people will be affected by noise levels >60dBA from overnight flights when Runway 23 is in use. This represents a reduction by as much as 67 per cent depending on the subsequent heading.



Idea 3

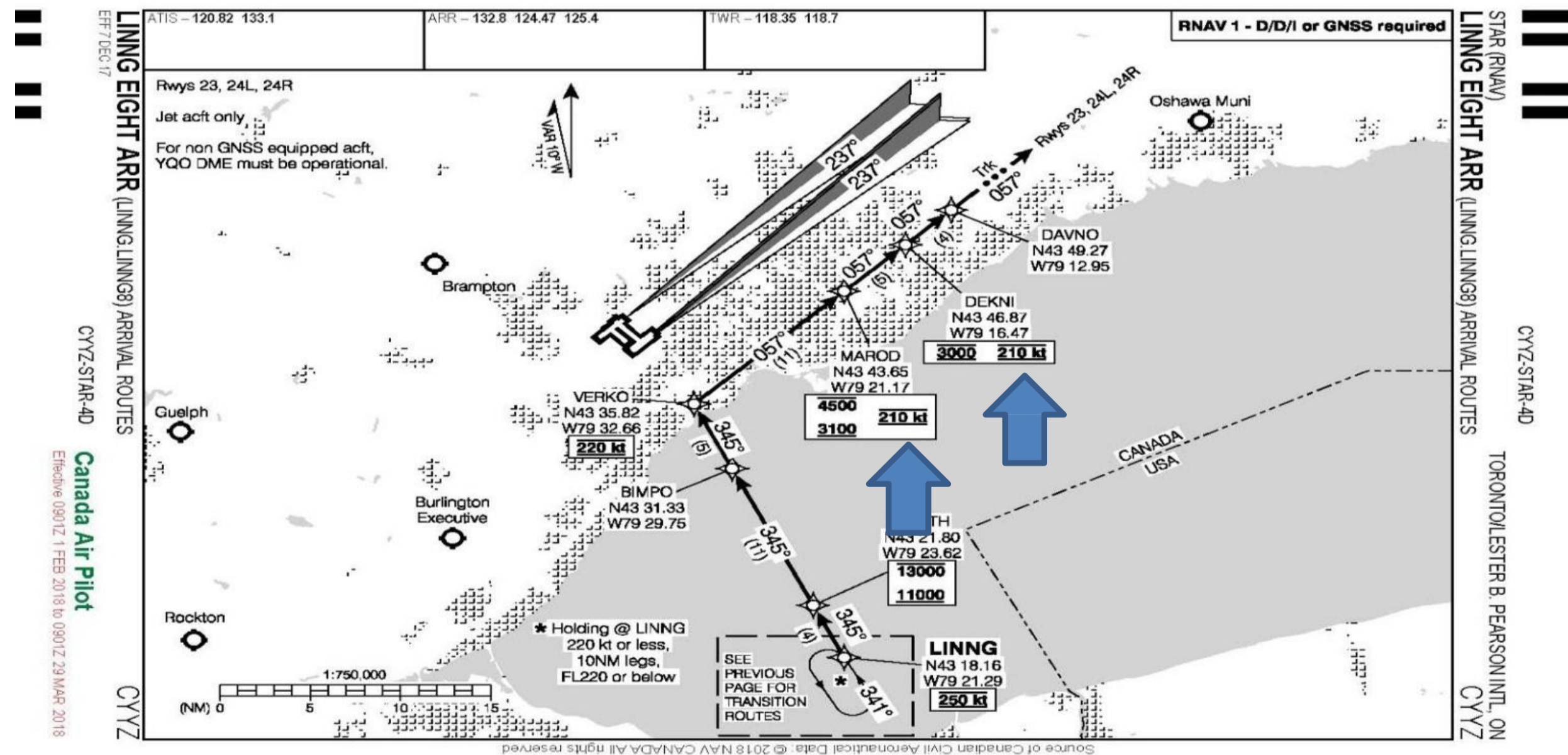
Increase Downwind Speed.

Effective April 2017, changes in speed restrictions on the downwind portion of the arrival flight path were implemented. This change is designed to reduce noise in some areas of the city by decreasing the need for flap use by pilots of larger aircraft needing to slow their airspeed as they approach the airport.



Increased Speed on the Downwind Leg

Changes to the published speeds on the “downwind” portion of the arrival flight path from 200 knots to 210 knots were implemented effective April 27, 2017 via an amendment to the Canada Air Pilot, the aeronautical publication used by pilots that includes all flight procedures for Toronto Pearson. This change in speed restriction has the potential to reduce noise in some areas of the city by decreasing the need for flap use by pilots of larger aircraft needing to slow their airspeed as they approach the airport.





Idea 4

Continuous Descent Operations.

Increasing the use of Continuous Descent Operations enables aircraft to be at higher altitudes during a longer portion of the arrival. It also enables more aircraft to operate in a clean, quieter profile at a reduced thrust and flap setting. In some cases, the proposal will allow for more aircraft to cut across Lake Ontario and avoid using the downwind leg.



Continuous Descent Operations (CDO)

What we are proposing

Quieter aircraft arrival operations through increased use of Continuous Descent Operations (CDO) and reduced use of the downwind.

Why is this being proposed?

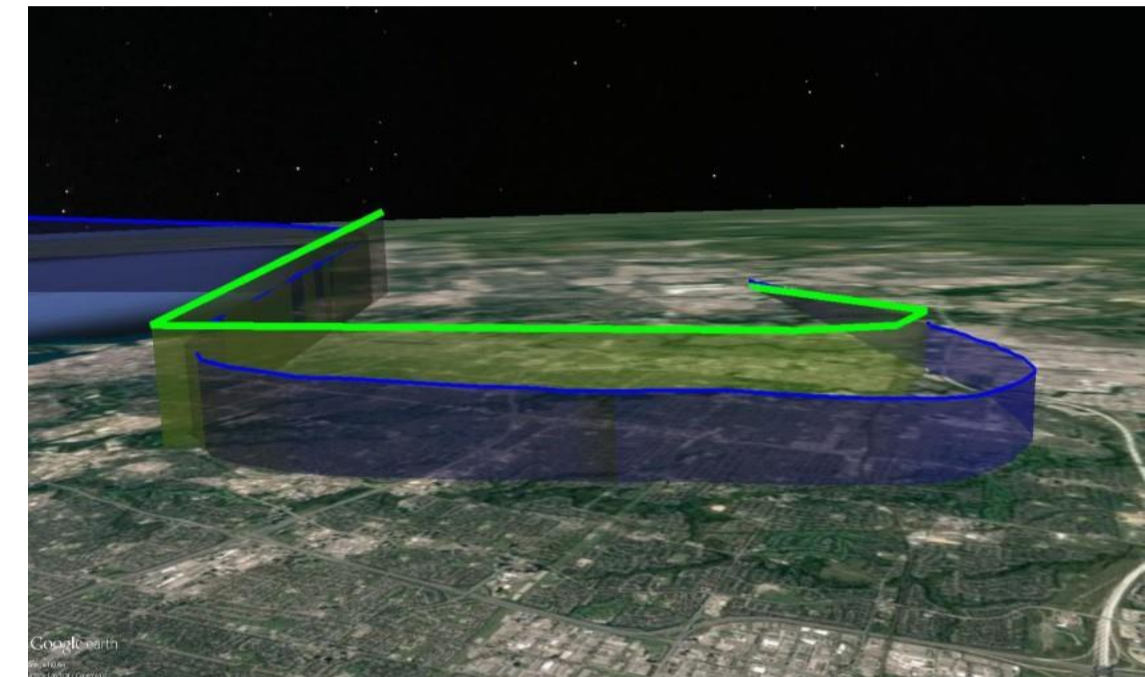
Increasing the use of continuous descent operations will enable more aircraft to operate in a quieter flight profile. In some cases, the proposal will better enable “short cuts” to final that reduce use of the downwind portion of the existing flight path.

When would this be used?

These approaches can be used during daytime and evening periods when traffic is relatively light. Usage will depend on capacity demands and tactical sequencing requirements; not all traffic will be cleared to use these approaches. During busy traffic periods operations at Toronto Pearson require use of a high low procedure to ensure safe separation between aircraft and use of the new approaches would be precluded. The approaches for 15 and 33 can also be used as nighttime approaches, as the base leg portion of the approaches are already outside the boundaries of the city.

What are the benefits?

Continuous descent approaches are the quietest type of approach, offering noise reductions between 1 and 5 decibels depending on the phase of flight. A reduced noise footprint from continuous descent, combined with flight path optimization, results in fewer residents overflown at noise levels above of 60 dBA - by as much as 28 per cent for some approaches.



The image above shows a sample flight track as flown in blue. In green, the proposed new transition to the final approach. Some aircraft will be significantly higher than they are today as the turn on to the base leg.



Continuous Descent Operations (CDO)

Runway 05

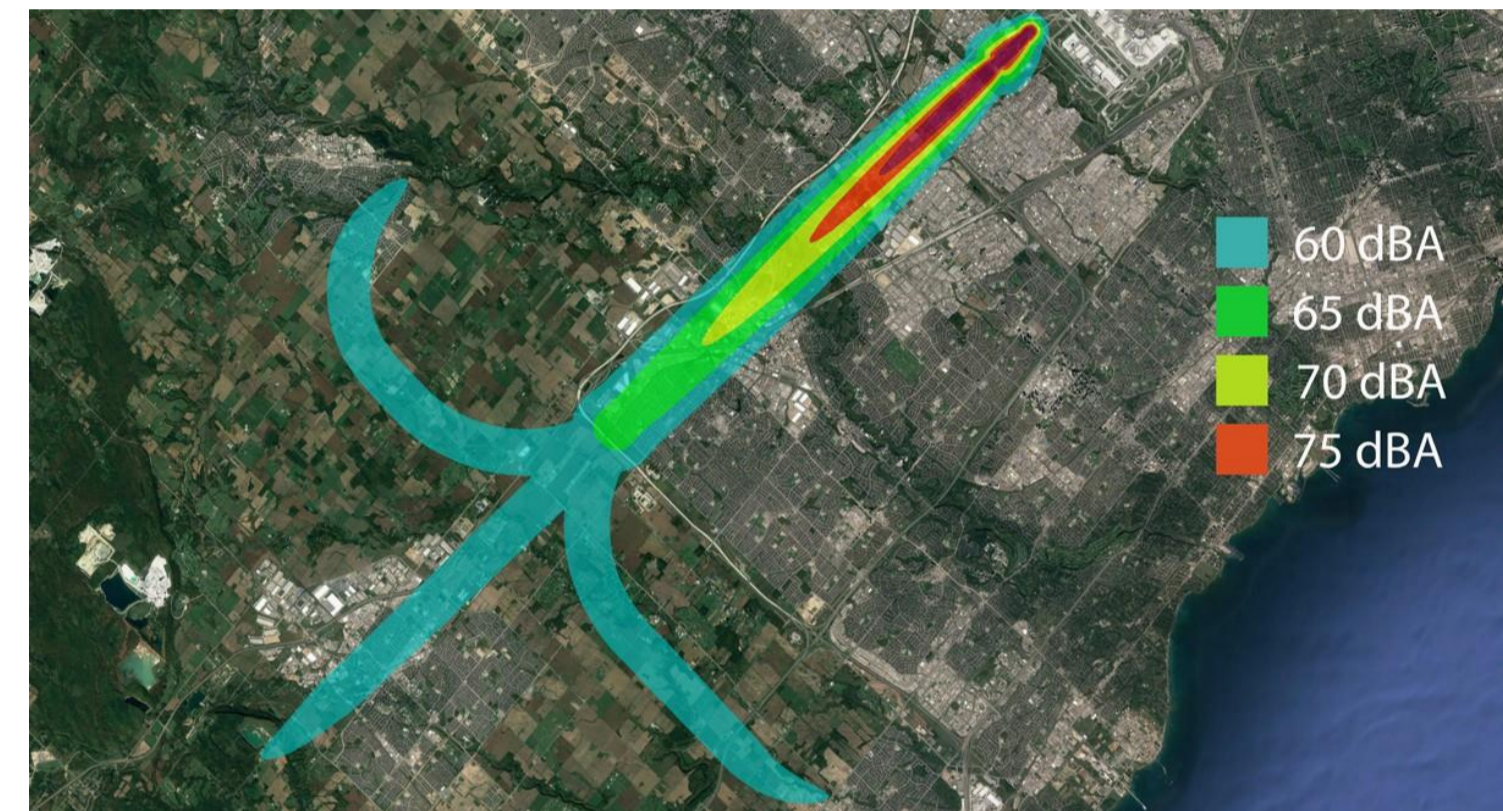
The new base leg portion of the approach to 05 will help enable continuous descent while keeping aircraft higher when compare to aircraft turning at a similar point today.



Above: Map shows a four hour sample of arrivals when 05 and 06L were in use.



Left: Map shows the composite standard arrival routes and new base leg to runway 05 in black; shaded areas show where there is expected to be some traffic distribution.



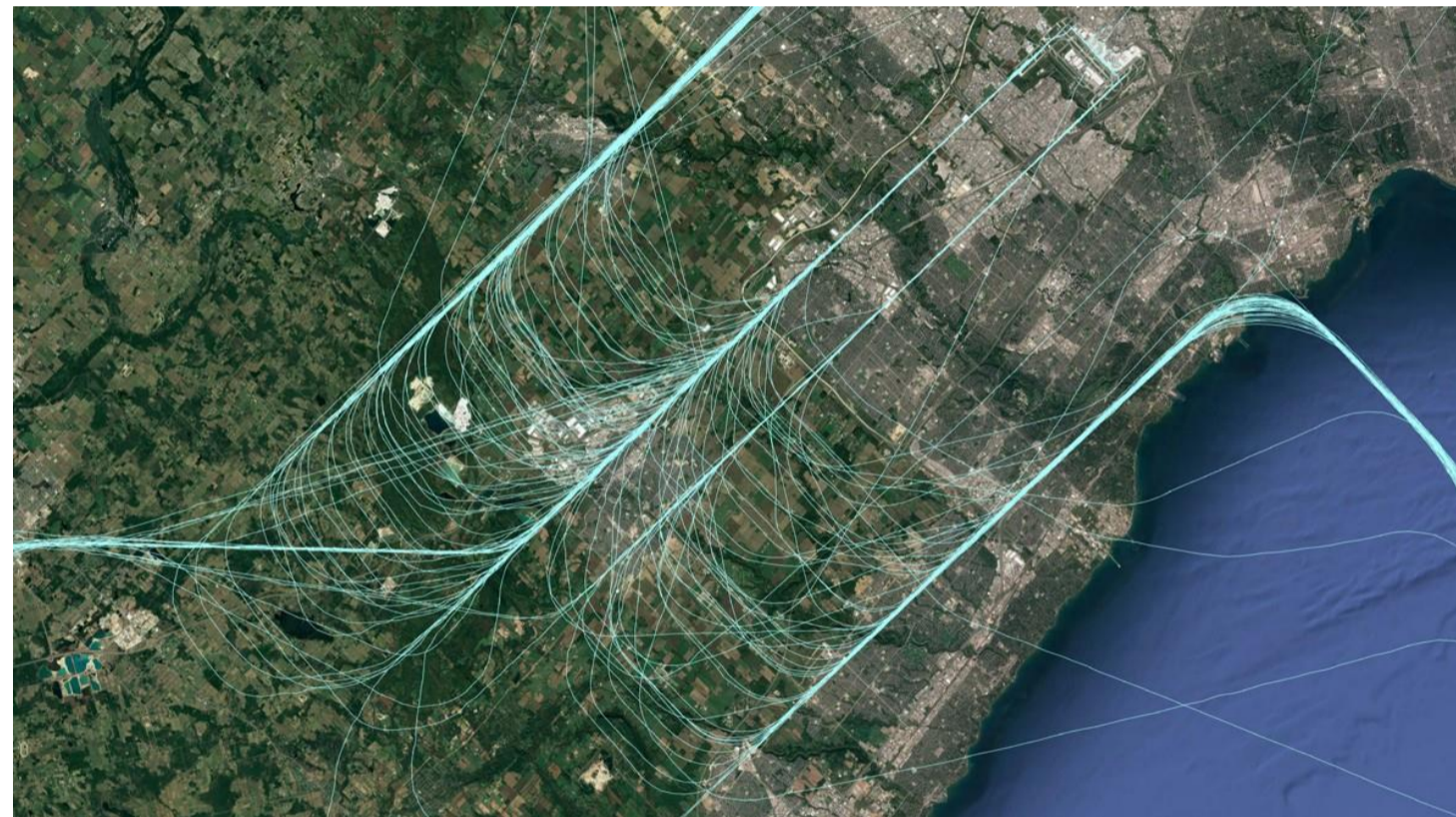
Above: Map shows the modeled noise footprint of an aircraft (737-800) flying the arrival procedure. Noise analysis suggests that as many as 7,000 fewer people will be affected by noise levels >60dBA from overnight flights when Runway 05 is in use. This represents a reduction by as much as 7 per cent depending on the approach.



Continuous Descent Operations (CDO)

Runway 06L

The new base leg portion of the approach to 06L will help enable continuous descent while keeping aircraft higher when compared to aircraft turning at a similar point today.



Above: Map shows a four hour sample of arrivals when 05 and 06L were in use.



Left: Map shows the composite standard arrival routes and new base leg to runway 06L in black; shaded areas show where there is expected to be some traffic distribution.



Above: Map shows the modeled noise footprint of an aircraft (737-800) flying the arrival procedure. Noise analysis suggests that as many as 27,000 fewer people will be affected by noise levels >60dBA from overnight flights when Runway 06L is in use. This represents a reduction by as much as 13 per cent depending on the approach.



Continuous Descent Operations(CDO)

Runway 23

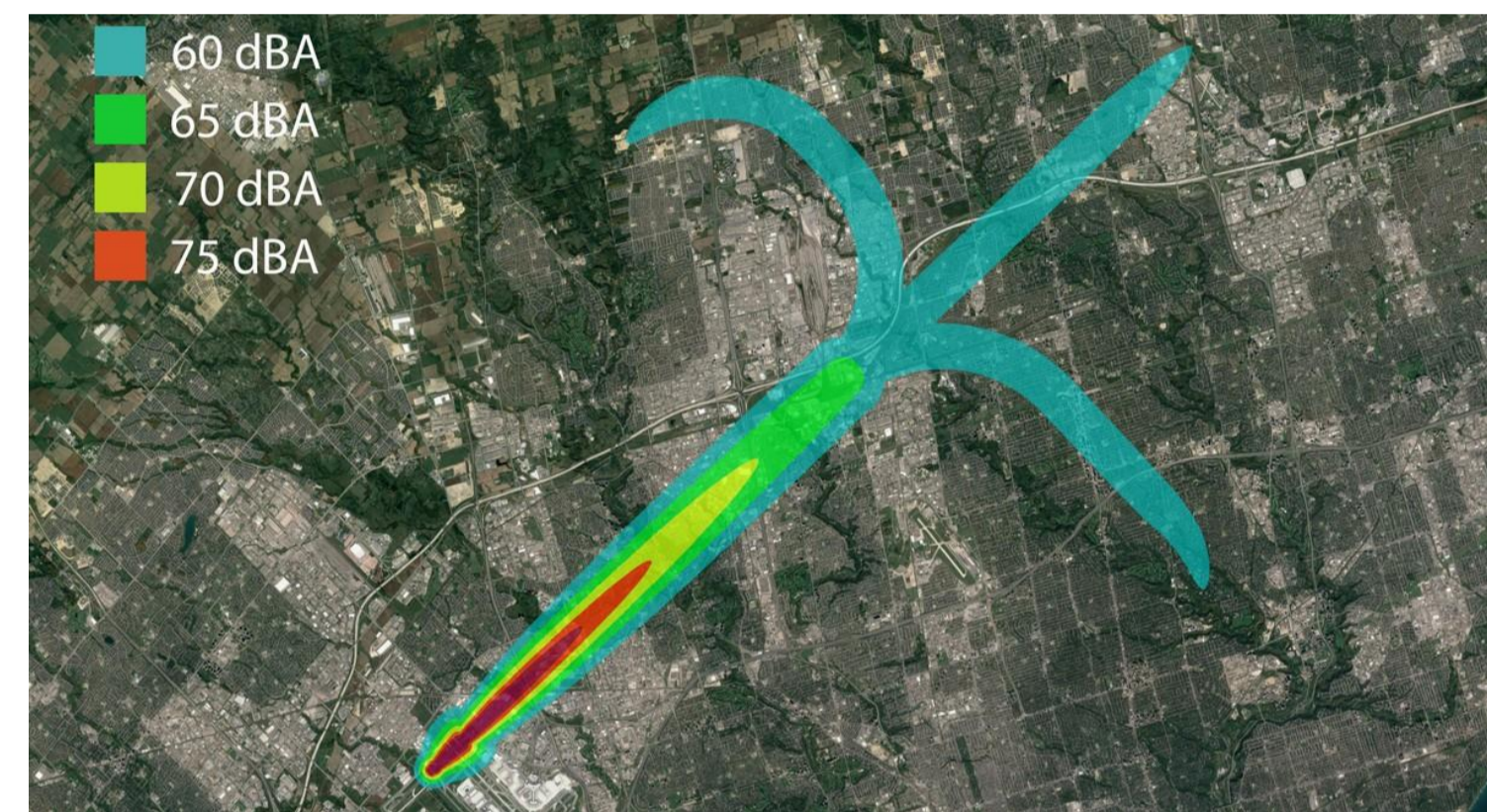
The new base leg portion of the approach to 23 will help enable continuous descent while keeping aircraft higher when compare to aircraft turning at a similar point today.



Above: Map shows a four hour sample of arrivals when 23 and 24R were in use.



Left: Map show the composite standard arrival routes and new base leg to runway 23 in black; shaded areas show where there is expected to be some traffic distribution.



Above: Map shows the modeled noise footprint of an aircraft (737-800) flying the arrival procedure. Noise analysis suggests that as many as 22,000 fewer people will be affected by noise levels >60dBA from overnight flights when Runway 23 is in use. This represents a reduction by as much as 8 per cent depending on the approach.



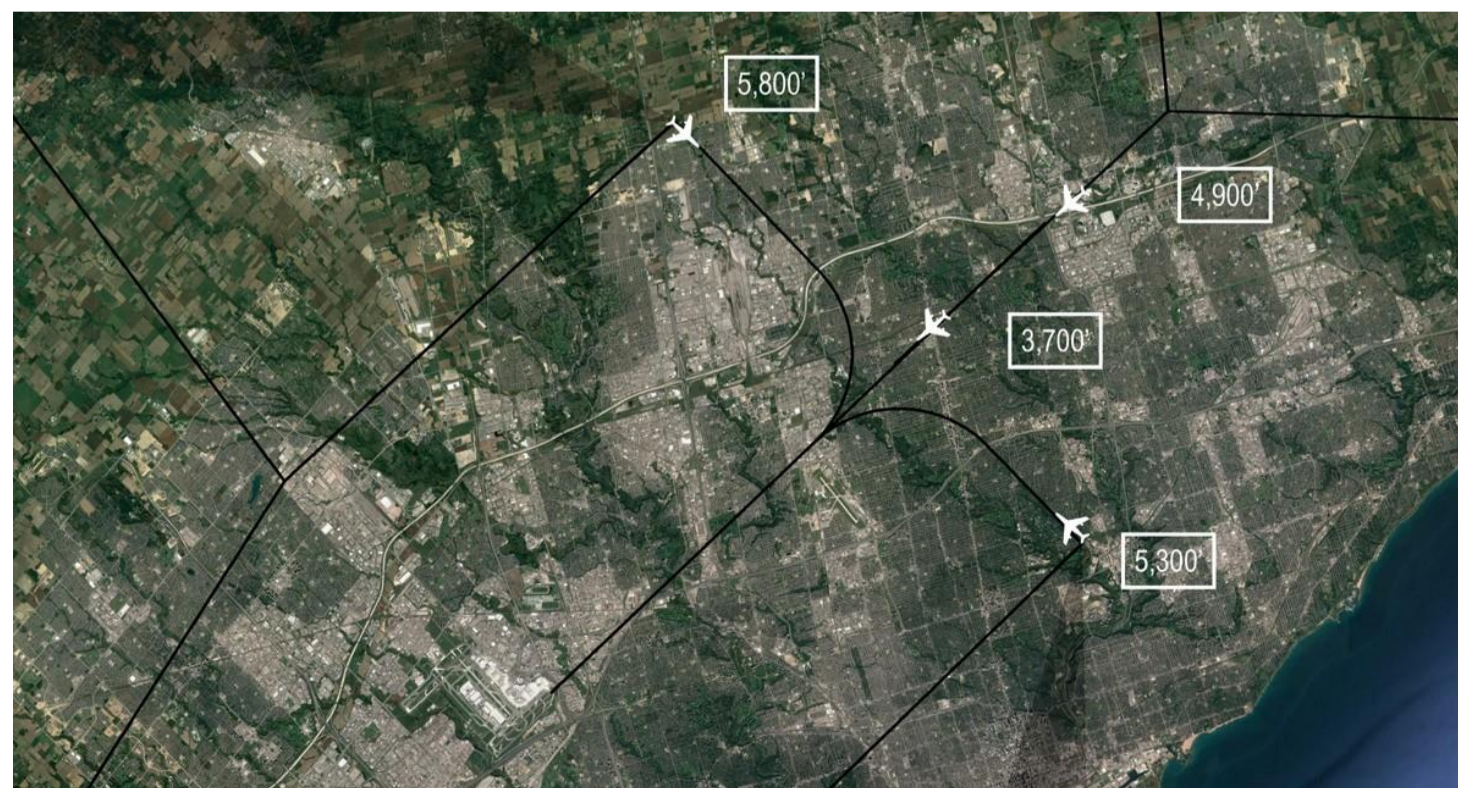
Continuous Descent Operations (CDO)

Runway 24R

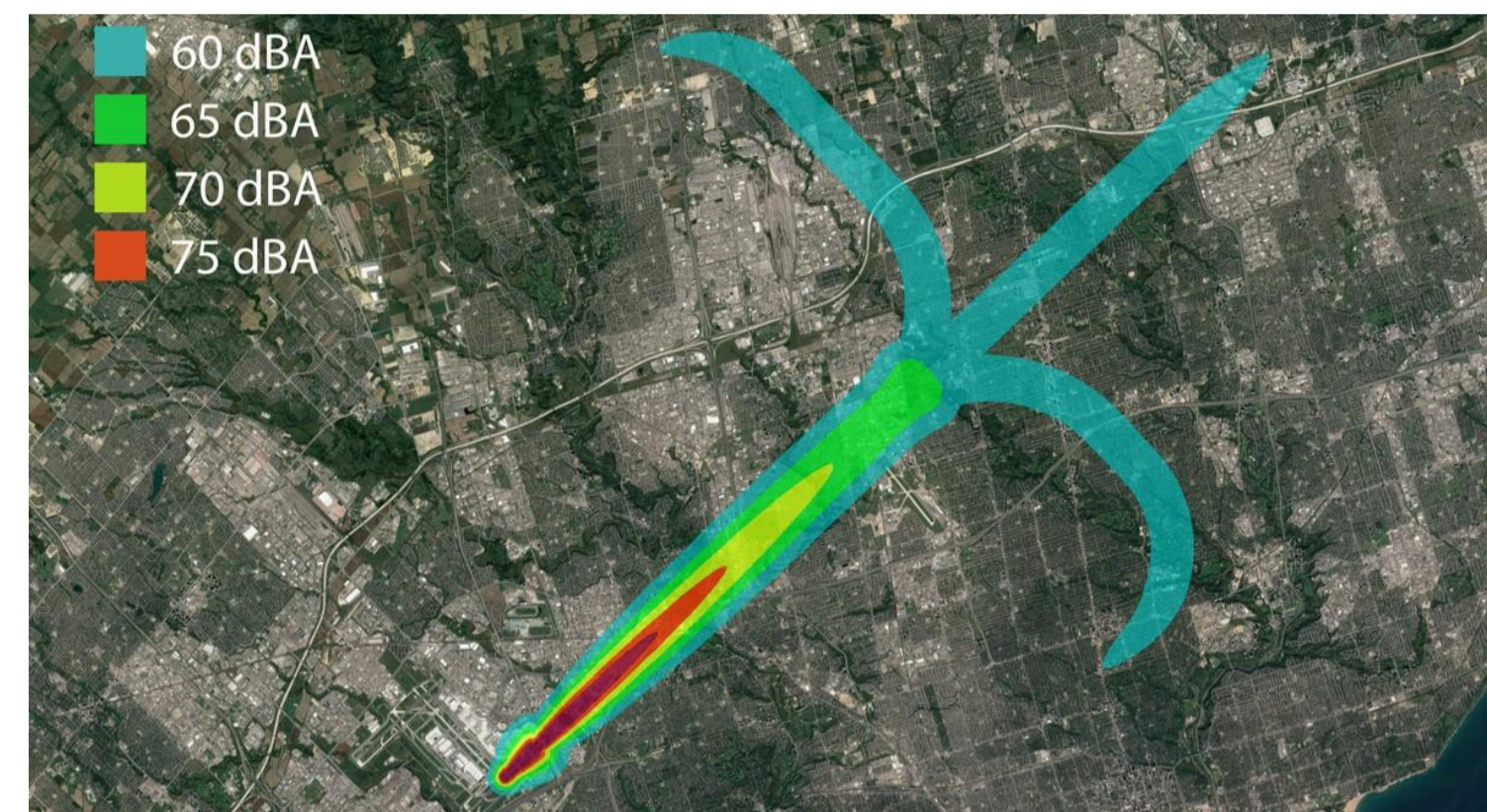
The new base leg portion of the approach to 24R will help enable continuous descent while keeping aircraft higher when compare to aircraft turning at a similar point today.



Above: Map shows a four hour sample of arrivals when 23 and 24R were in use.



Left: Map shows the composite standard arrival routes and new base leg to runway 24R in black; shaded areas show where there is expected to be some traffic distribution.



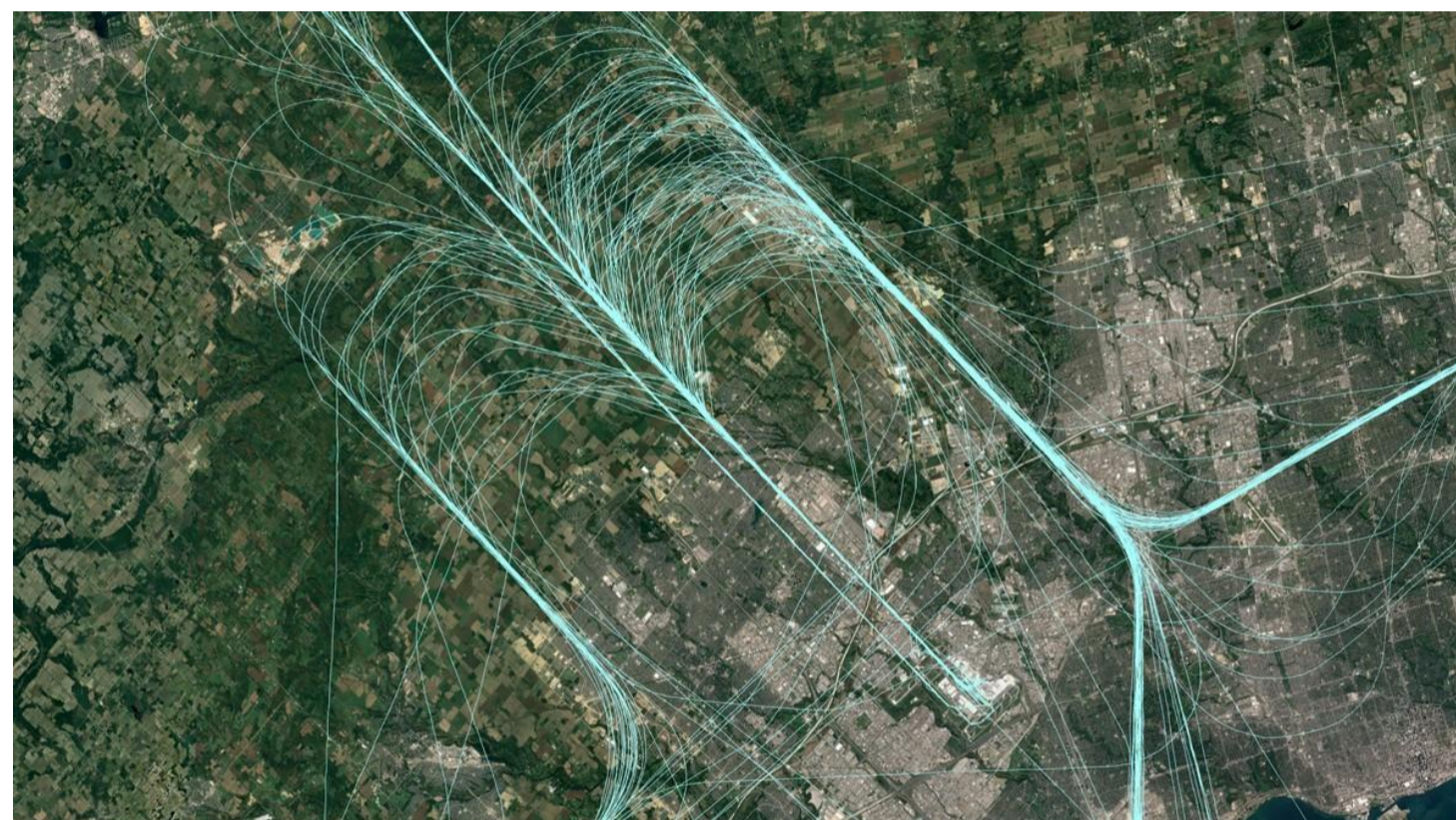
Above: Map shows the modeled noise footprint of an aircraft (737-800) flying the arrival procedure. Noise analysis suggests that as many as 80,000 fewer people will be affected by noise levels >60dBA from overnight flights when Runway 24R is in use. This represents a reduction by as much as 14 per cent depending on the approach.



Continuous Descent Operations (CDO)

Runway 15L

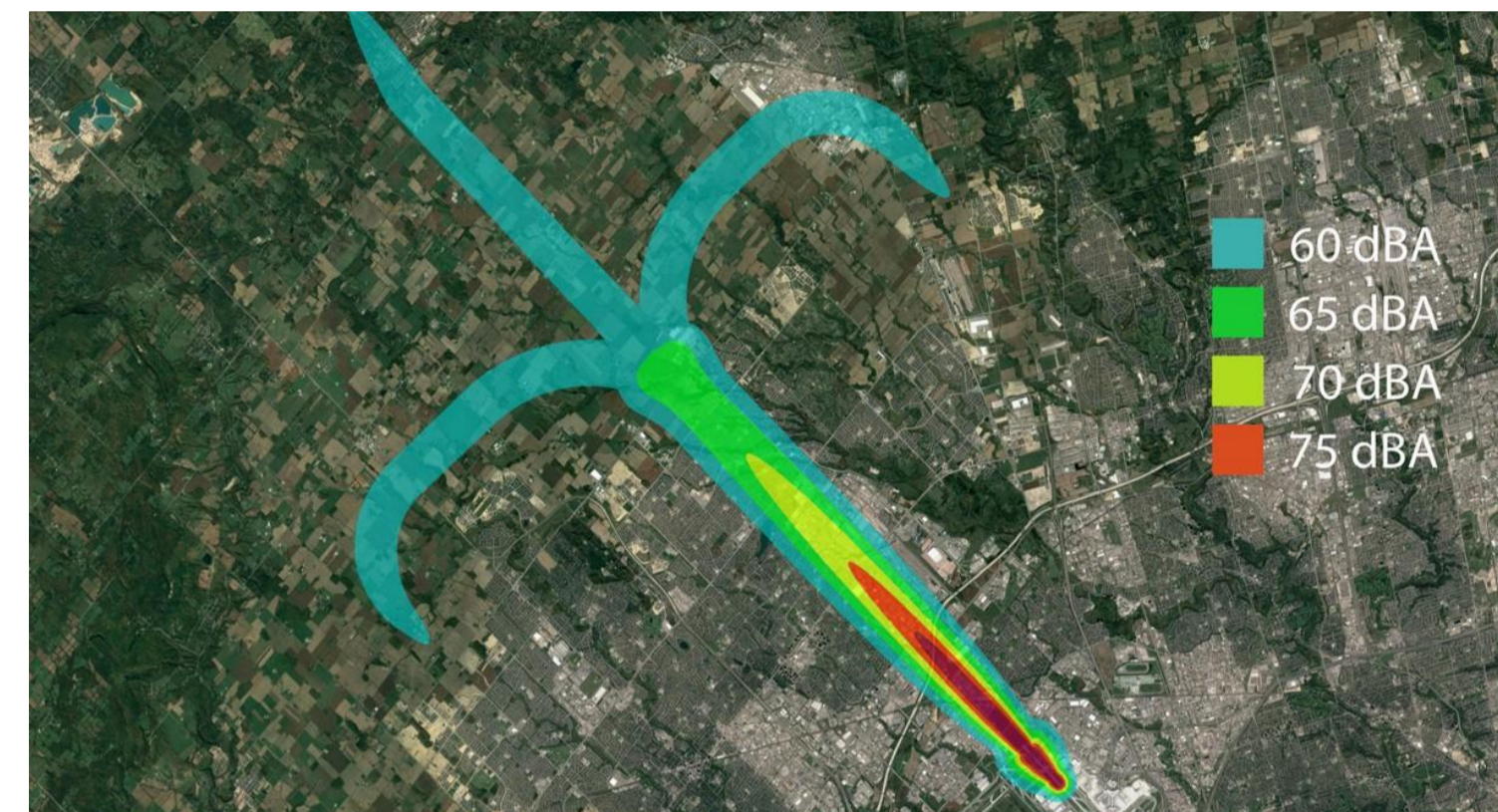
The new base leg portion of the approach to 15L will help enable continuous descent while keeping aircraft higher when compared to aircraft turning at a similar point today.



Above: Map shows a four hour sample of arrivals when 15L and 15R were in use.



Left: Map shows the composite standard arrival routes and new base leg to runway 15L.



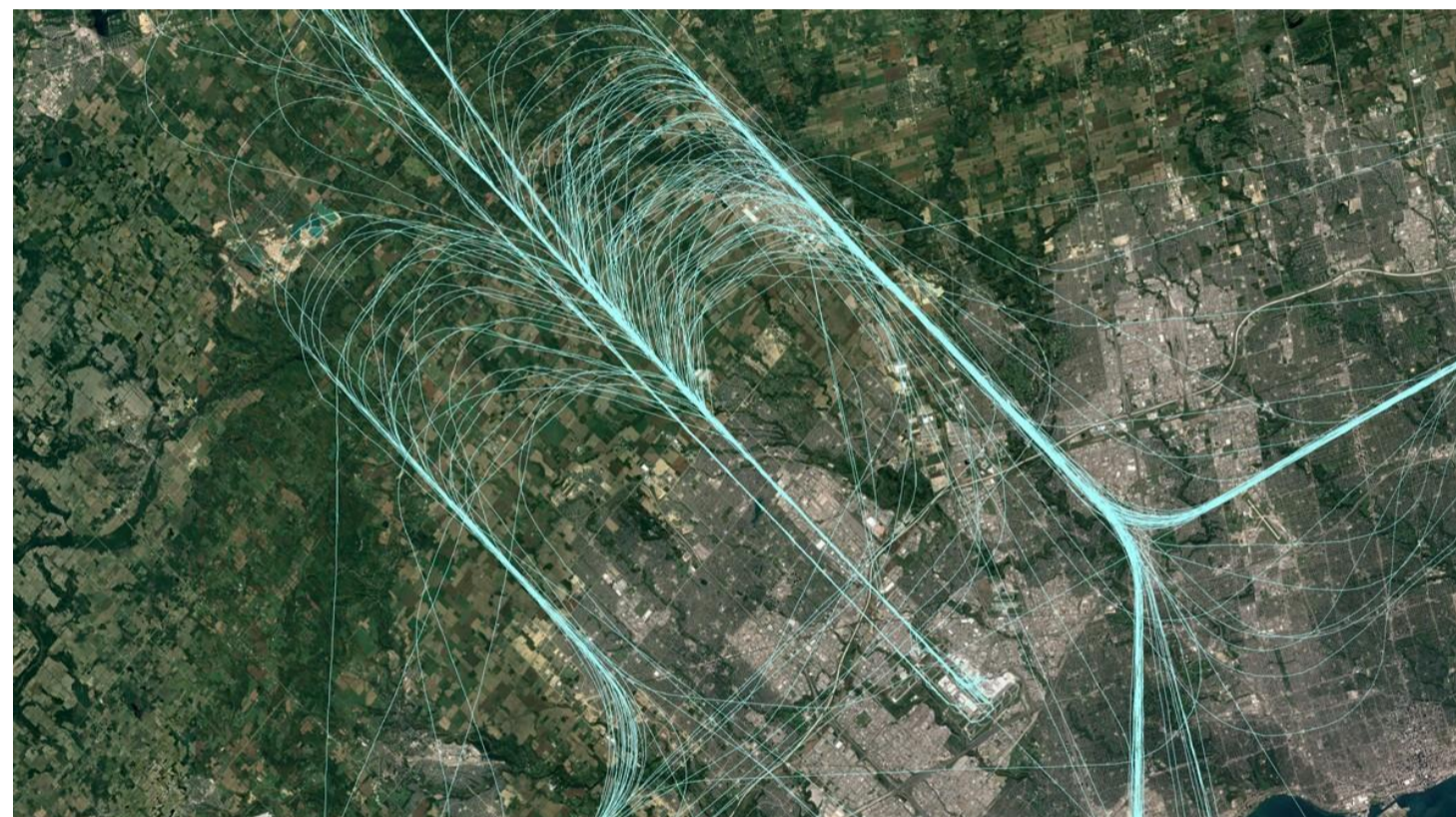
Above: Map shows the modeled noise footprint of an aircraft (737-800) flying the arrival procedure. Noise analysis suggests that as many as 27,000 fewer people will be affected by noise levels >60dBA from flights when Runway 15L is in use. This represents a reduction by as much as 24 per cent depending on the approach.



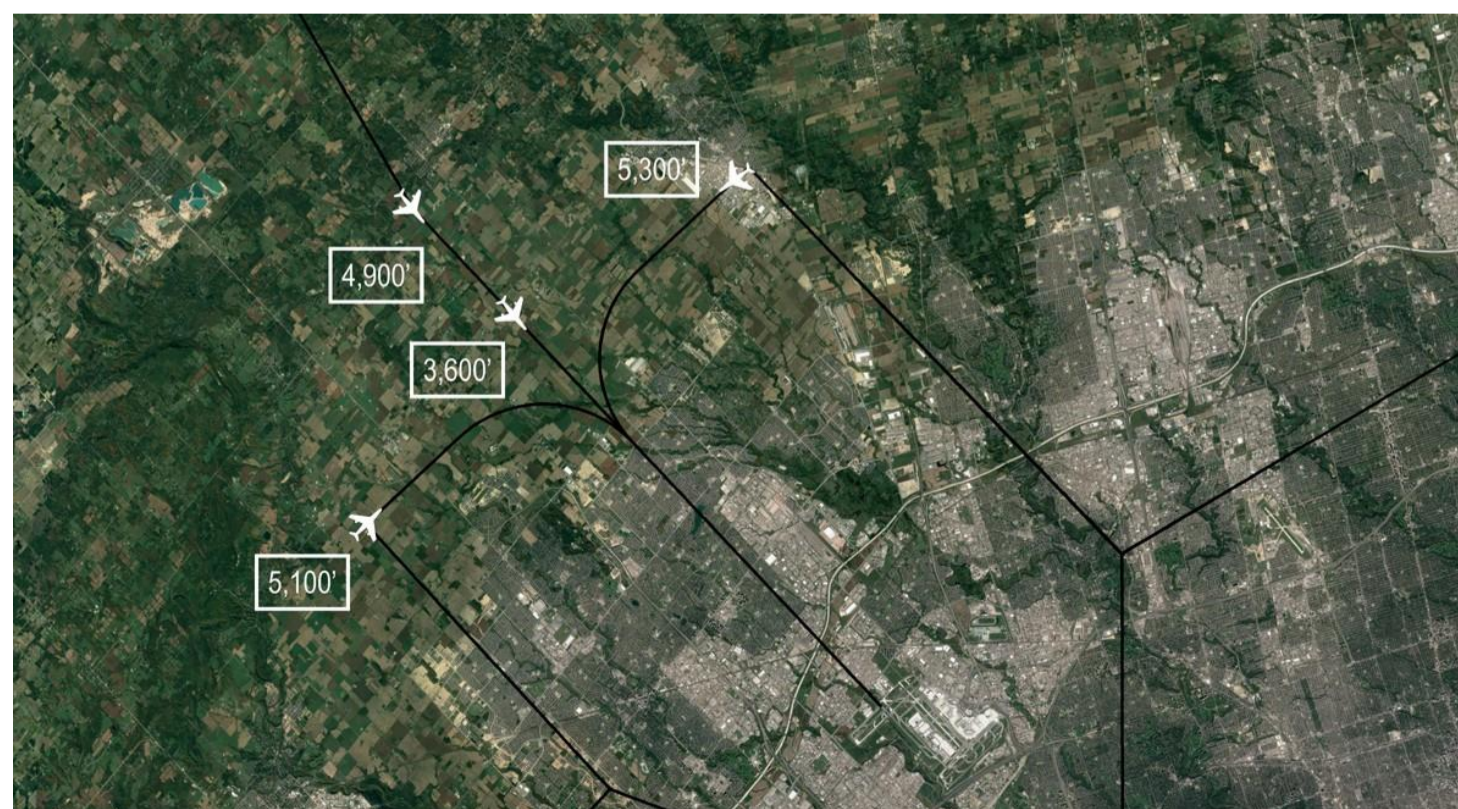
Continuous Descent Operations (CDO)

Runway 15R

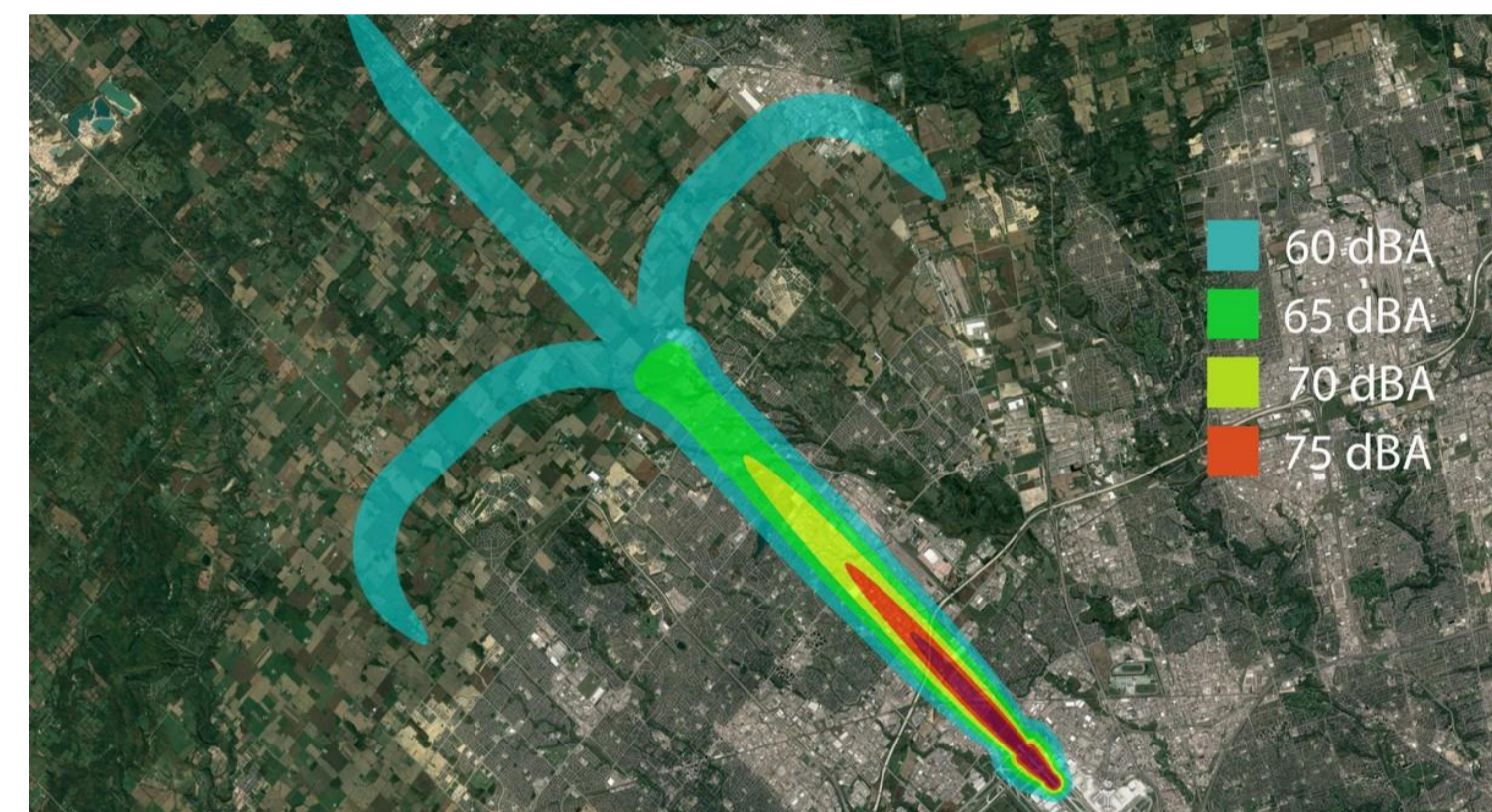
The new base leg portion of the approach to 15R will help enable continuous descent while keeping aircraft higher when compared to aircraft turning at a similar point today.



Above: Map shows a four hour sample of arrivals when 15L and 15R were in use.



Left: Map shows the composite standard arrival routes and new base leg to runway 15R.



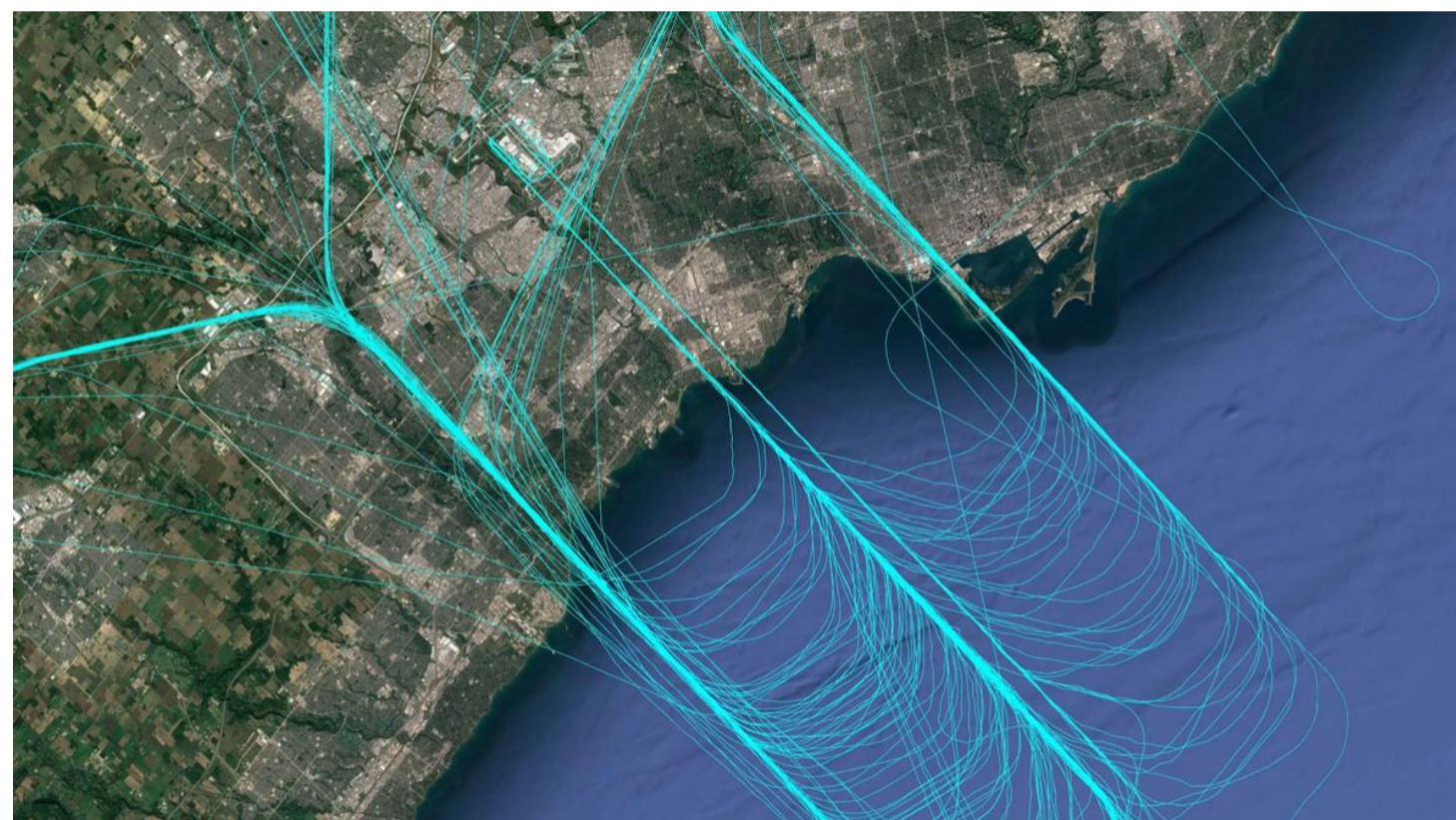
Above: Map shows the modeled noise footprint of an aircraft (737-800) flying the arrival procedure. Noise analysis suggests that as many as 27,000 fewer people will be affected by noise levels >60dBA from flights when Runway 15R is in use. This represents a reduction by as much as 28 per cent depending on the approach



Continuous Descent Operations(CDO)

Runway 33L

The new base leg portion of the approach to 33L will help enable continuous descent while keeping aircraft higher when compare to aircraft turning at a similar point today.



Above: Map shows a four hour sample of arrivals when 33L and 33R were in use.



Left: Map shows the composite standard arrival routes and new base leg to runway 33L.



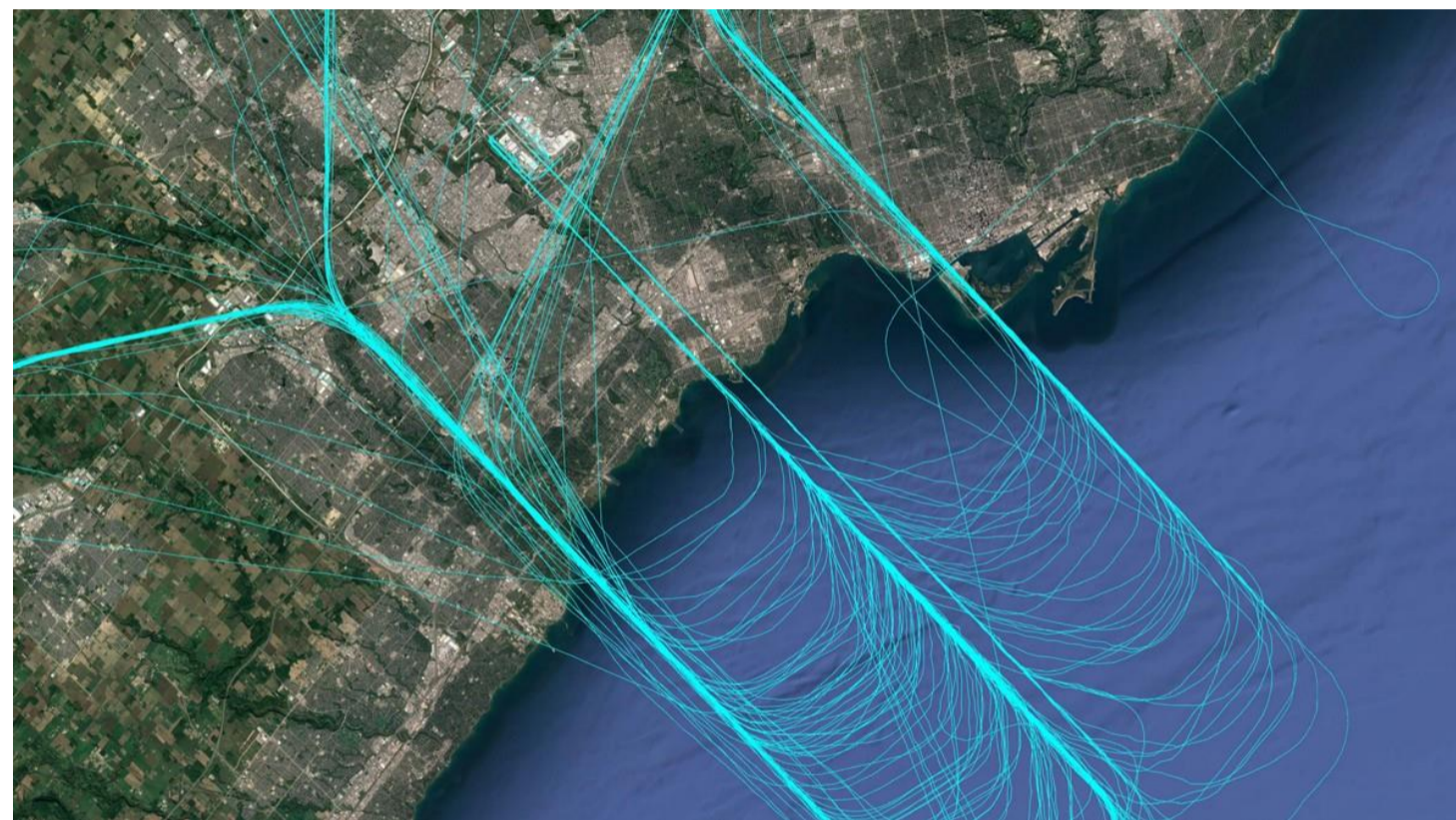
Above: Map shows the modeled noise footprint of an aircraft (737-800) flying the arrival procedure. Noise analysis suggests that as many as 27,000 fewer people will be affected by noise levels >60dBA from flights when Runway 33L is in use. This represents a reduction by as much as 24 per cent depending on the approach.



Continuous Descent Operations (CDO)

Runway 33R

The new base leg portion of the approach to 33R will help enable continuous descent while keeping aircraft higher when compare to aircraft turning at a similar point today.



Above: Map shows a four hour sample of arrivals when 33L and 33R were in use.



Left: Map shows the composite standard arrival routes and new base leg to runway 33R.



Above: Map shows the modeled noise footprint of an aircraft (737-800) flying the arrival procedure. Noise analysis suggests that as many as 27,000 fewer people will be affected by noise levels >60dBA from flights when Runway 33L is in use. This represents a reduction by as much as 24 per cent depending on the approach.



Idea 5

Summer Weekend Runway Alternation Program.

Many international airports operate programs designed to provide residents with predictable respite from aircraft noise by rotating runway usage during low traffic periods. This program would provide residents under the final approach and initial departure paths of the east/west runways with predictable respite on summer weekends.



Summer Weekend Runway Alternation

Many top-tier international airports provide residents with predictable relief from aircraft noise by rotating runway usage.

What we studied

Two options for a summer weekend runway alternation program:

- involving all runways (east/west and north/south)
 - Not feasible due to capacity and demand projections
- involving only the east/west runways
 - Residents could experience **13 weekends of relief over the summer** months
 - Will provide some predictable respite for residents living under final approach or initial departure paths for these runways
 - Residents living under the downwind would not see respite from this program

What we are proposing

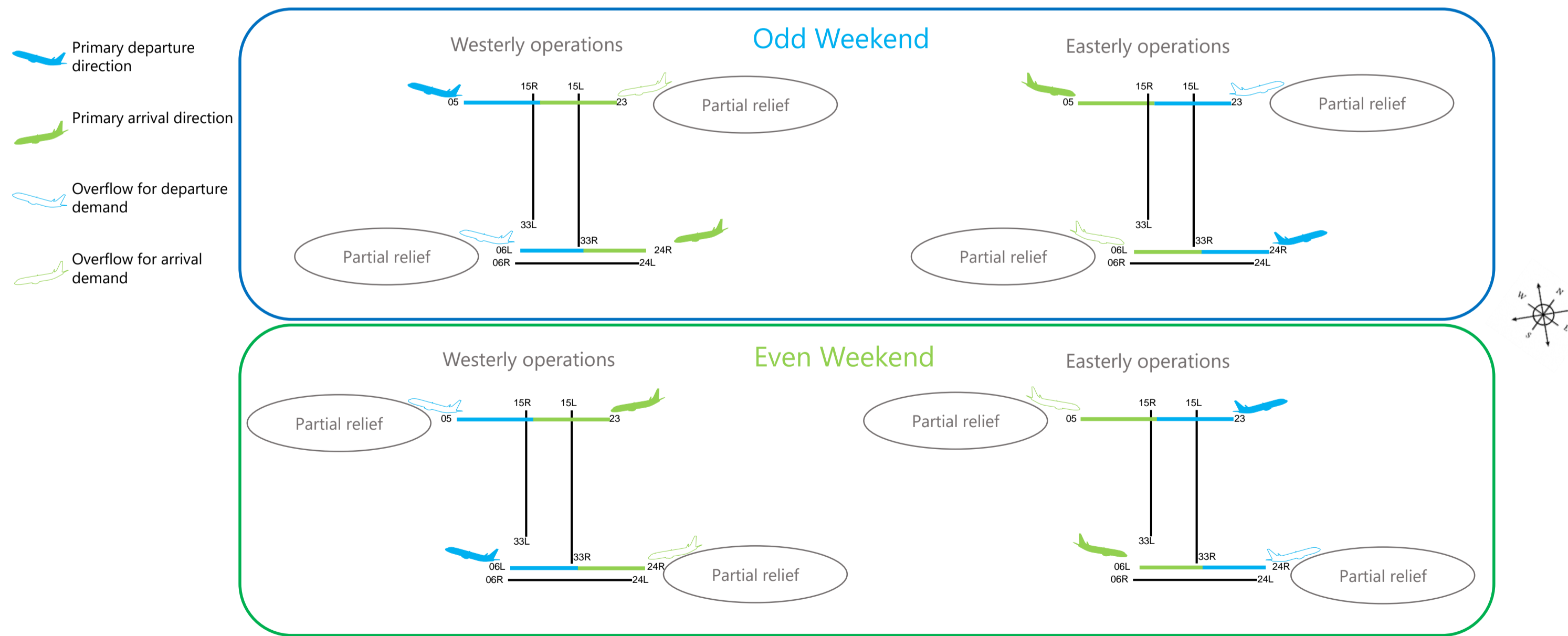
- Summer weekend runway alternation program involving the three east/west runways
- May to October, inclusive (26 weekends) between 6:30 a.m. and 11:59 p.m.
- A schedule would be published so residents would know in advance what to expect and could plan accordingly



Summer Weekend Runway Alternation

How it will work

- Residents would receive full or partial respite on alternate weekends. Partial respite relates to the “offload” of additional arrivals or departures on a primary runway
- Residents would receive full impact on alternate weekends
- Published schedule of expected runway configurations allowing residents to plan weekends. In effect May-October



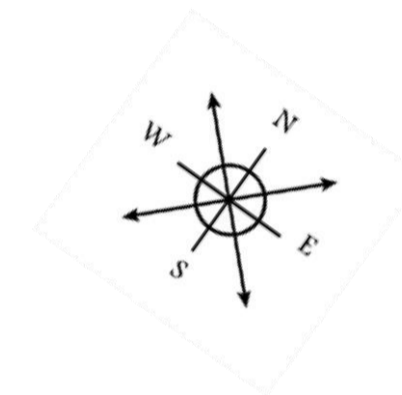
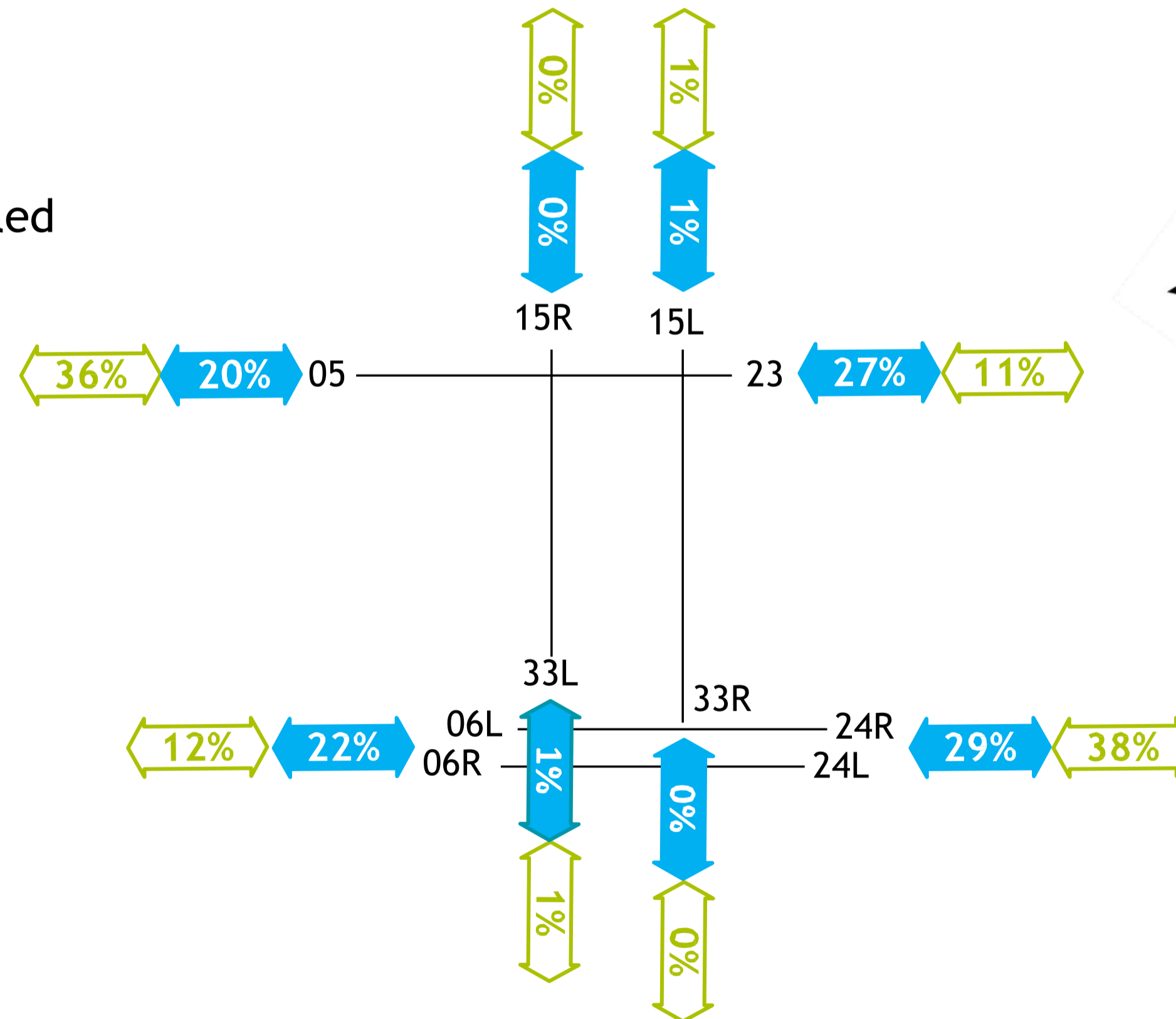


Summer Weekend Runway Alternation

Status quo versus program

0% 2015 Actual

0% Future Modelled





Summer Weekend Runway Alternation

Why were the north/south runways not included?

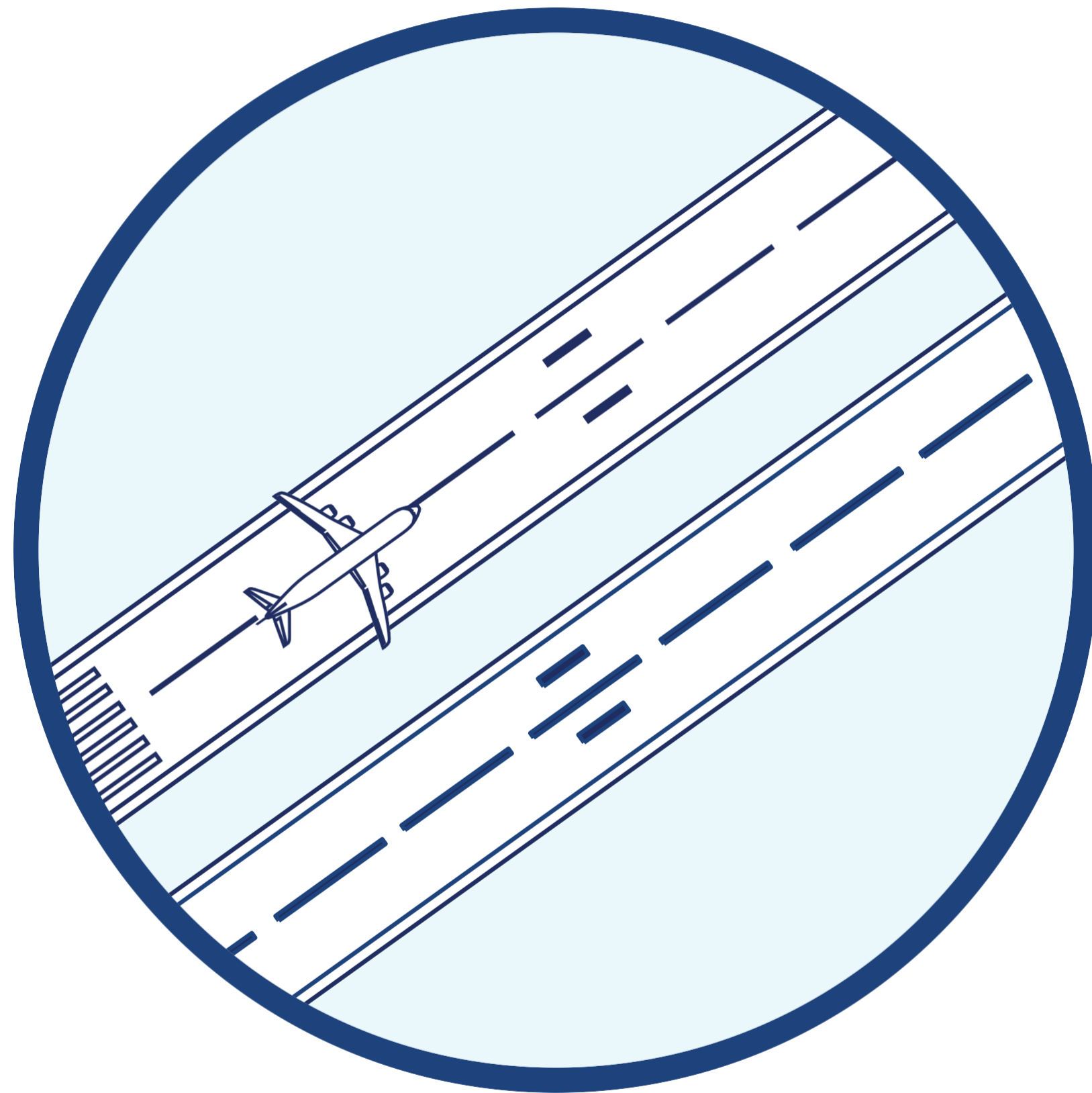
The Residents' Reference Panel (RRP) provided the GTAA with community views on the next phase of our growth.

The panel recommended that the GTAA only pursue a runway alternation program if respite is meaningful and predictable.

Technical analysis shows that any alternation program including the north/south runways do not meet these guidelines:

- Reliable and predictable scheduled use of the north/south runways is not achievable
- North/south runways cannot operate at same capacity level as east/west runways, therefore unsustainable during heavy traffic periods and as traffic levels increase

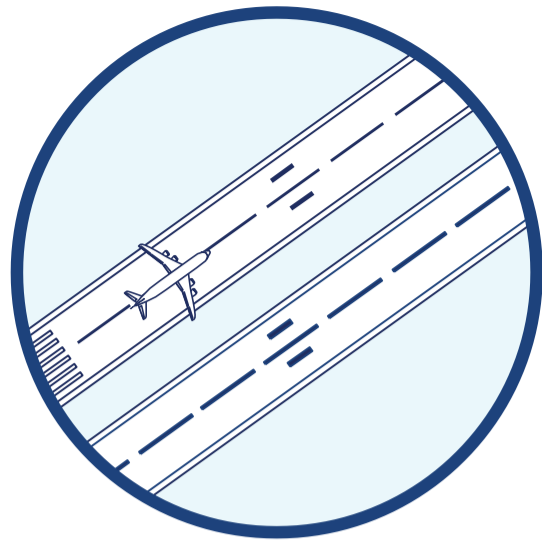
Please note: an east/west summer weekend runway alternation program does not mean that residents under the north/south runways will not experience aircraft overhead. These runways will be used in instances such as wind, weather or runway availability.



Idea 6

Preferential Runway System Review.

Toronto Pearson uses a preferential runway system from midnight to 6:30 a.m. in order to minimize impacts on residential areas. Proposed changes will further minimize the population affected by nighttime aircraft noise and provide residents with more clarity on which runways will be used in which weather conditions.

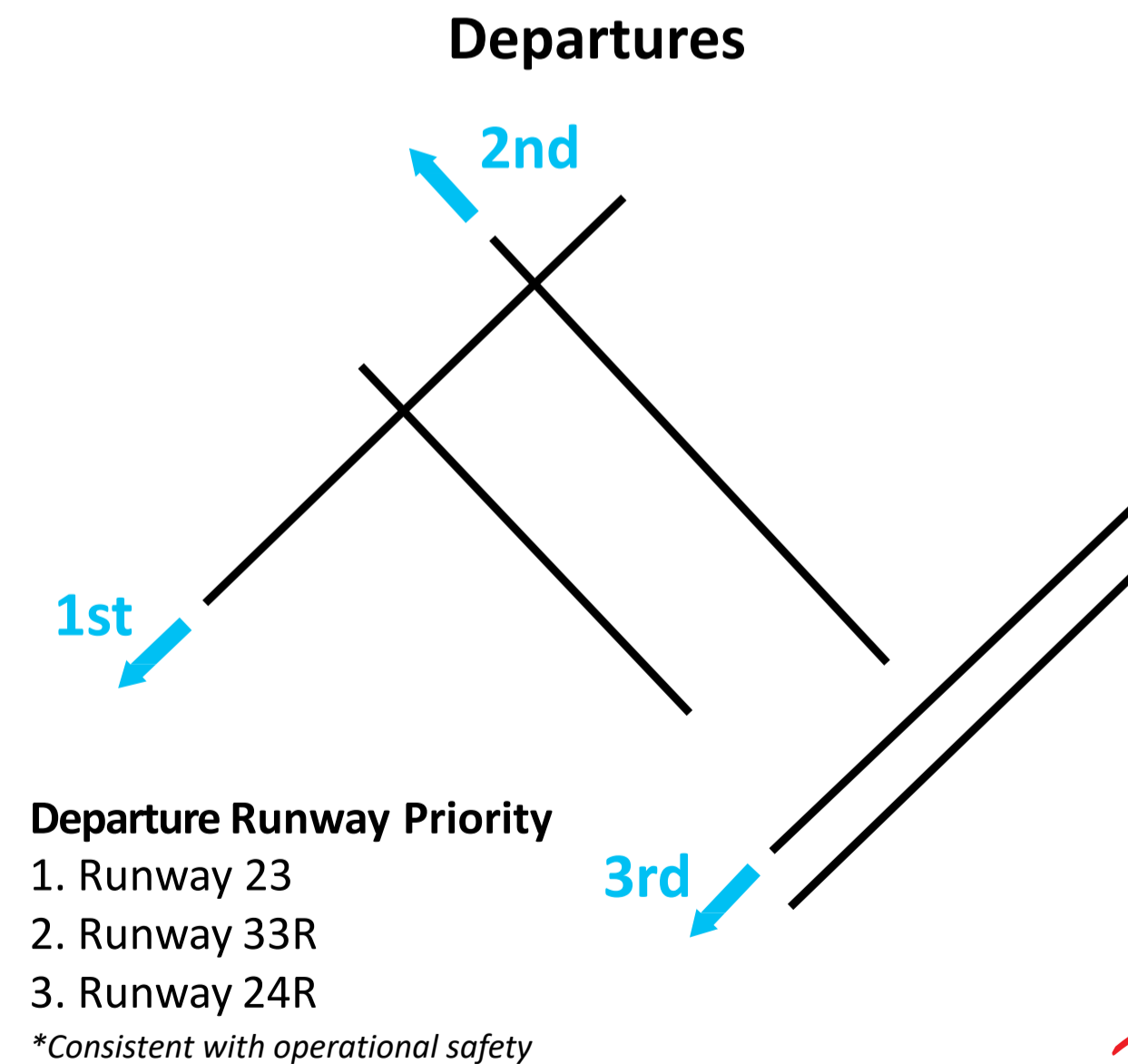
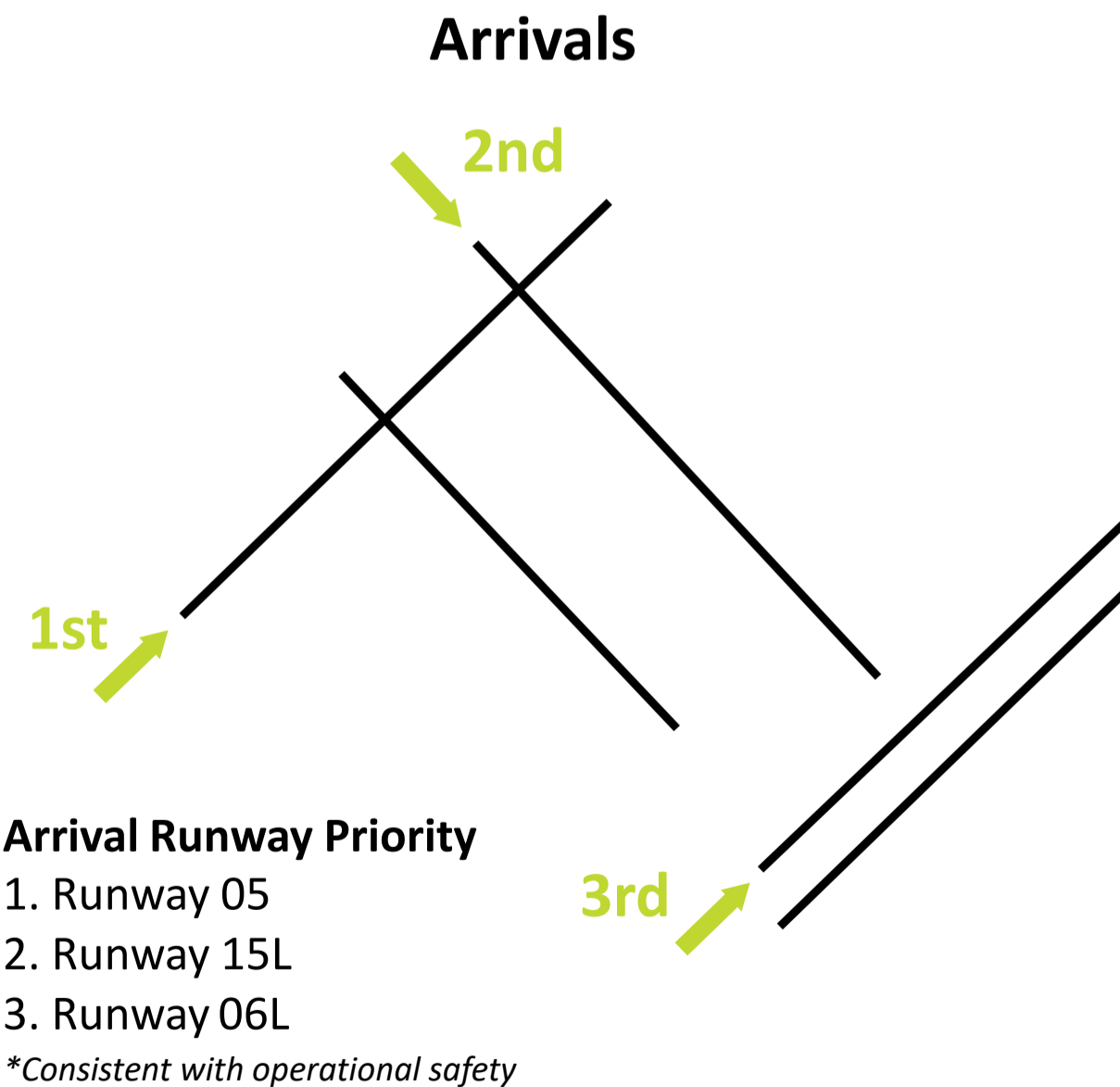


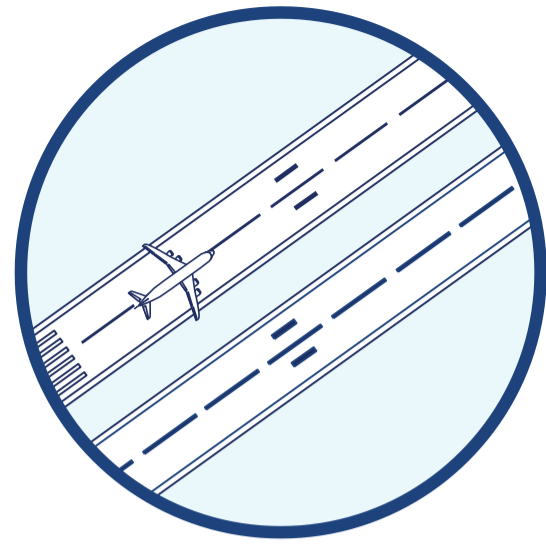
Preferential Runway System Review

Toronto Pearson's preferential runway system is intended to minimize the population overflow between midnight and 6:30 a.m.

The current system that was designated in the 1970s. As the population around the airport has changed and additional runways have been built since the system was put in place, it was time to review the system.

Current Program





Preferential Runway System Review

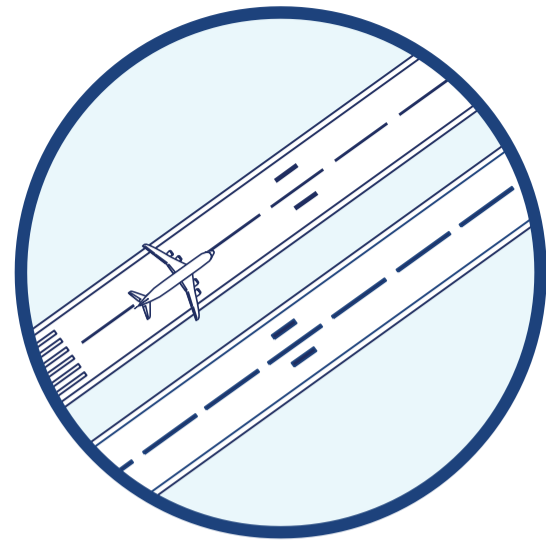
What we studied

We looked at our preferential runway system against the objective of flying over the fewest people possible. Our review found that changes need to be made to the current preferential runway system to meet this objective, and also to provide more reliable usage of the system.

What we are proposing

A revised nighttime preferential runway system which provides feasible runway pairings that:

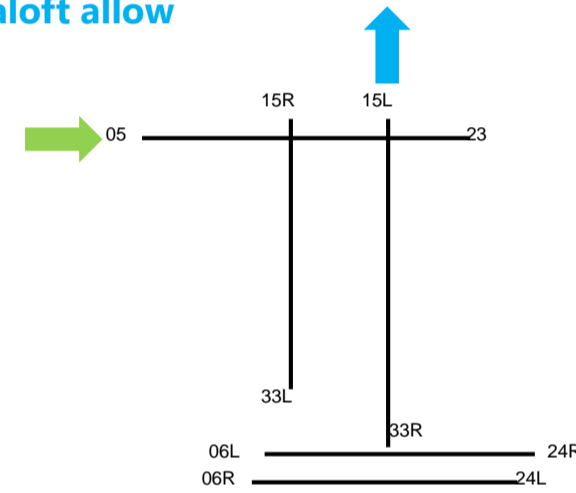
- minimizes the total population impacted by aircraft noise of 45dB CNEL or higher between midnight and 6:30 a.m.
- will improve the reliability of the system
- provides alternatives for “into the wind” configurations



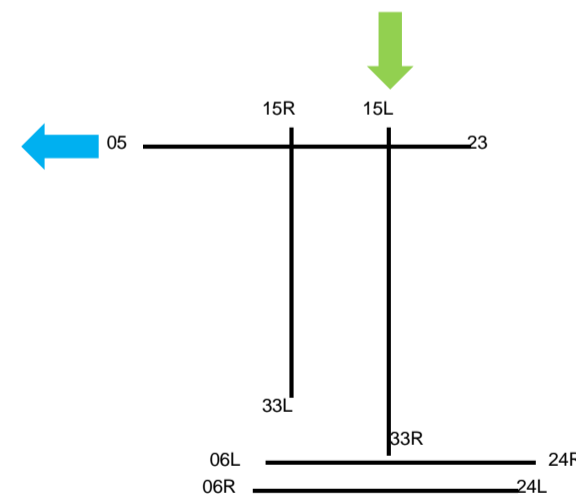
Preferential Runway System Review

Proposed System

1st Choice - Whenever crosswind, tailwinds & winds-aloft allow

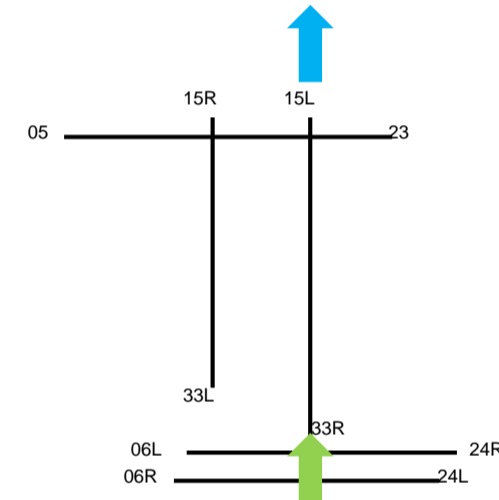


2nd Choice - Whenever crosswind, tailwinds & winds-aloft allow

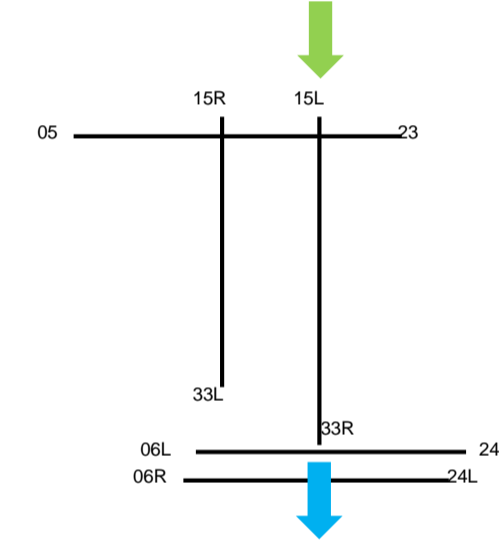


Selection driven by weather conditions and infrastructure availability when 1st or 2nd choice are not operable. Ultimately any single or pair of runways can be used.

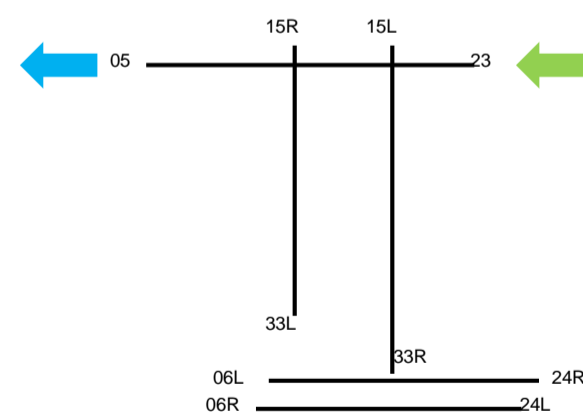
Operation for northerly wind



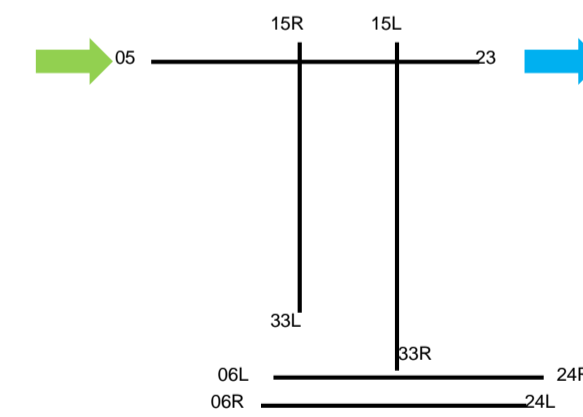
Operation for southerly wind

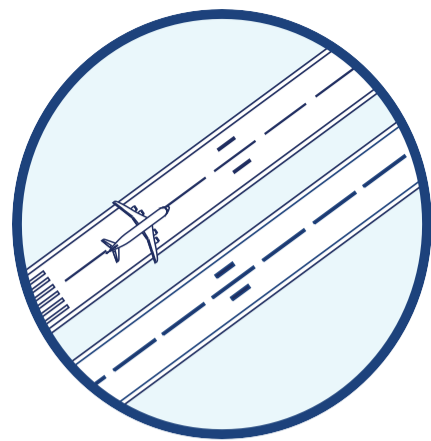


Operation for westerly wind



Operation for easterly wind

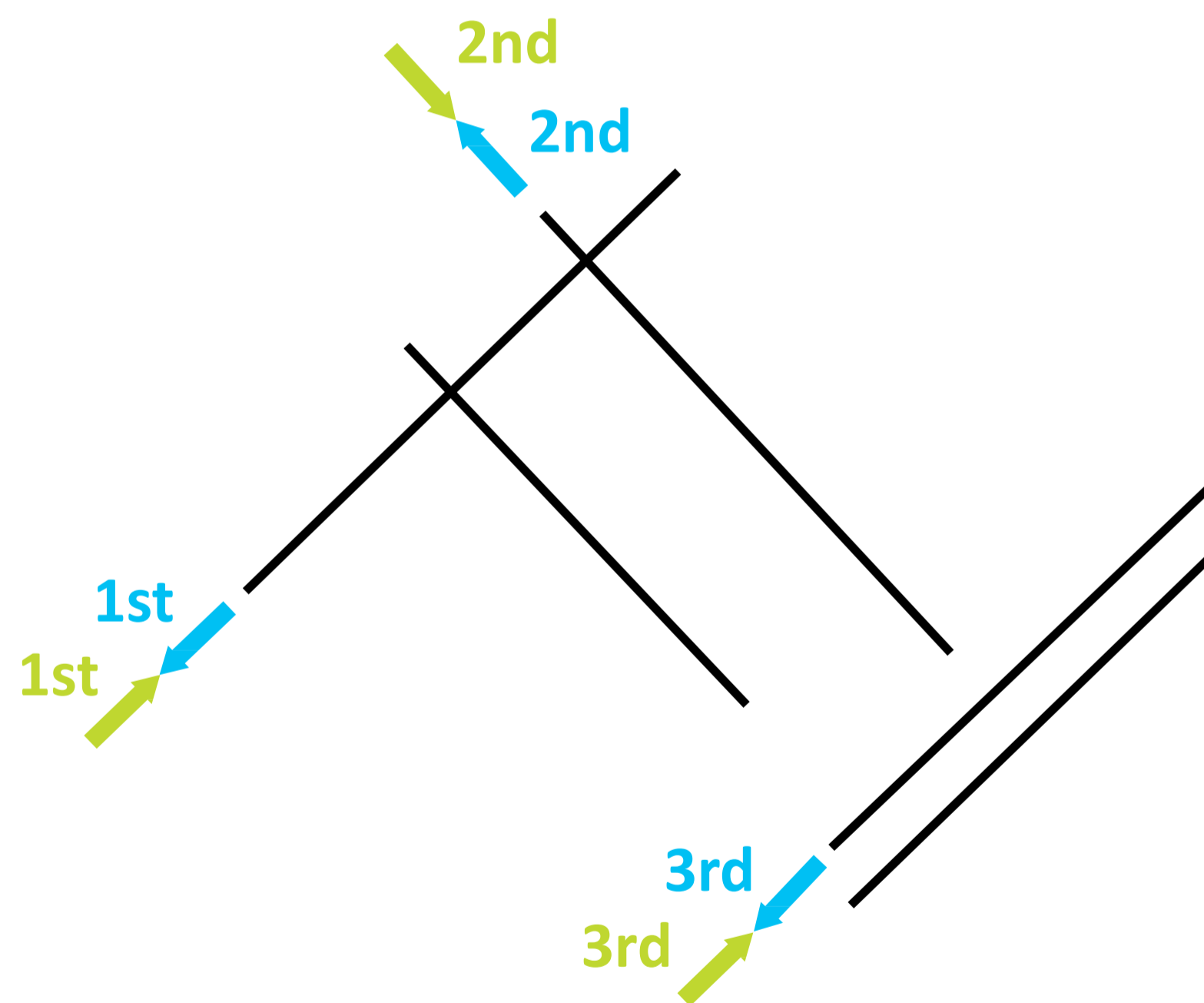




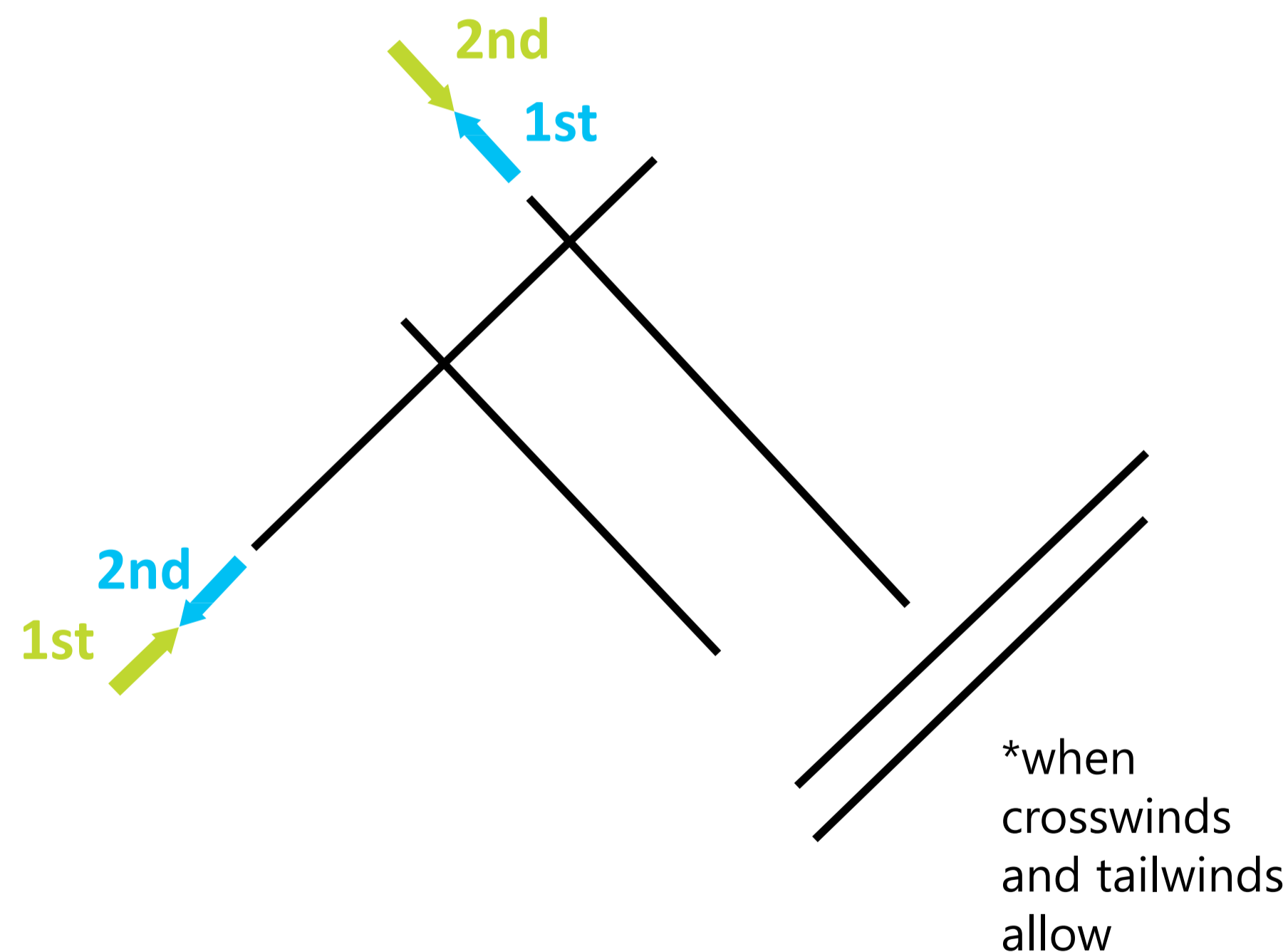
Preferential Runway System Review

Current System vs. Proposed System

Current System



Proposed System



What Happens Next

Providing Feedback

Residents will have the opportunity to provide their feedback on the six ideas through conversations and surveys. Surveys will be available online and at all consultation events.

What we will do with the feedback

Feedback from residents will be used to inform next steps on whether or not to proceed with implementation of ideas, or in the case of ideas 5 & 6, how tests should be run and how to measure their success.

All The Ways To Stay In Touch

To learn more about the Six Ideas:

www.torontoperson.com/conversations

To stay in touch

Visit www.torontoperson.com/community, call **416-776-5739**, or email community.engagement@gtaa.com to learn more.

To register a noise complaint

Contact the Noise Management Office at **416-247-7682** or online at <https://torontoperson.com/en/noisecomplaint/#>

On social media



[@TorontoPearson](#)

Who Does What in Noise Management?

At Toronto Pearson, the Greater Toronto Airports Authority (GTAA), NAV CANADA, Transport Canada and airlines all have a part to play in managing the operational impacts of noise.

Greater Toronto Airports Authority

- Not-for-profit private business
- Managed and operated the airport since 1996
- Develops and manages a Noise Management Program, such as Noise Abatement Procedures or Noise Operating Restrictions, and the Night Flight Restriction Program

NAV CANADA

- Air navigation provider in Canada, responsible for safe and efficient movement of aircraft
- Designs and publishes a network of air routes to design criteria set by Transport Canada and the International Civil Aviation Organization (ICAO)
- Assigns runways at Toronto Pearson by considering winds, weather, capacity and the preferential runway system

Transport Canada

- Regulator for aviation in Canada
- Ensures aircraft operating in Canada are compliant with international noise standards through aircraft certification process
- Establishes flight path design criteria and land-use guidelines based on noise exposure
- Enforces Noise Abatement Procedures and Noise Operating Restrictions and approves proposed changes to Noise Abatement Procedures and Noise Operating Restrictions put forward by the GTAA, as well as audits the airport's Night Flight Restriction Program

Airlines

- Responsible for conducting operations in accordance with the Transport Canada regulations and the initiatives under the airport's Noise Management Program, such as the Noise Abatement Procedures and Noise Operating Restrictions



Other Ways We Mitigate Noise

Elements of our Noise Management Program

We know our operations have impacts, and we are always working to manage and minimize those impacts while operating the airport in a safe, secure, efficient and financially viable manner for the public.

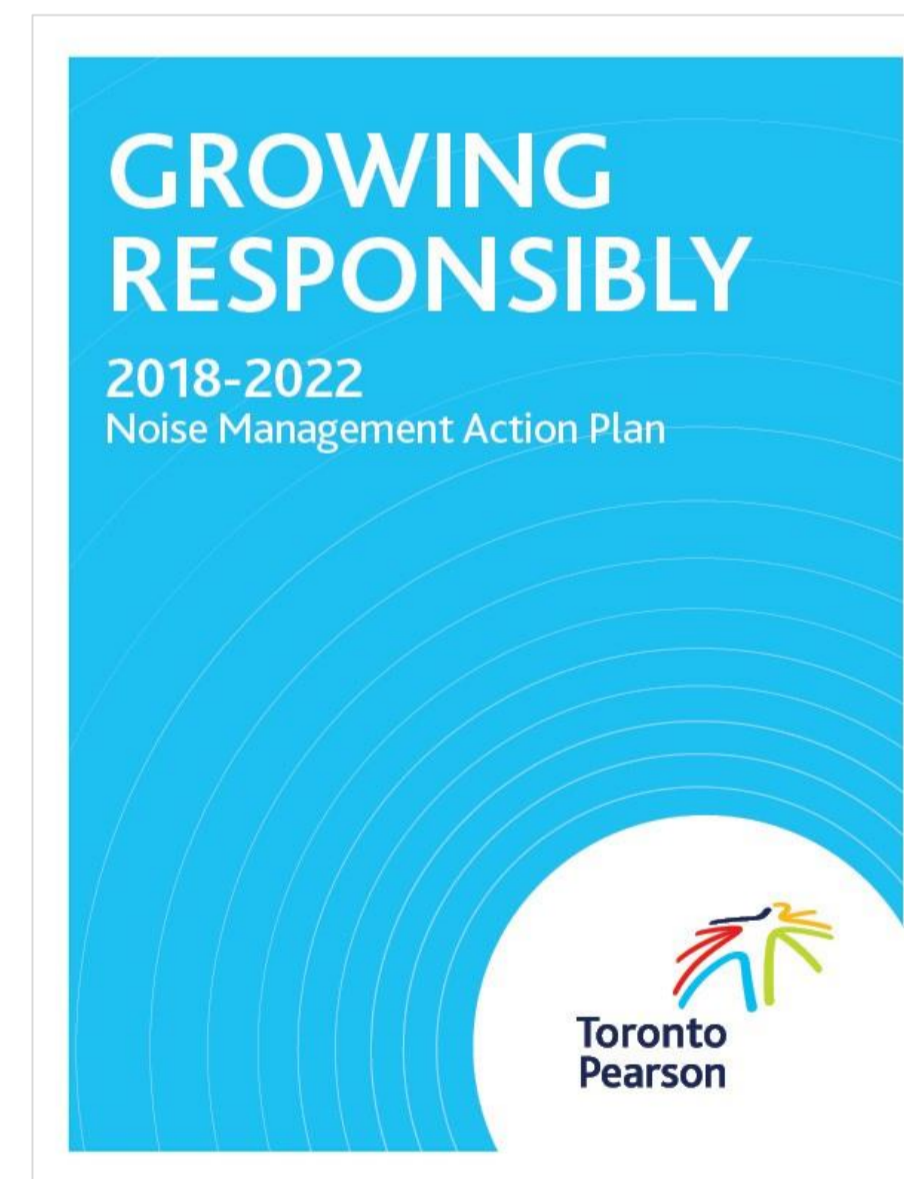
- Noise Operating Restrictions
 - Night Flight Restriction Program
 - Engine Run-Up Restrictions
 - Preferential Runway Assignment (midnight-6:30 a.m.)
- Noise Abatement Procedures
- Land Use Planning
- Enforcement Office
- Noise Management Office
- Consultation and Outreach

2018-2022 Noise Management Action Plan

Following a two-year process that included extensive community engagement, the GTAA released: Growing Responsibly: The 2018-2022 Noise Management Action Plan.

The Action Plan outlines ten new commitments related to consultation, environmental responsibility, operational changes, monitoring and reporting aircraft noise, and industry collaboration that the GTAA commits to taking a leadership role in developing concrete action on.

1. We will collaborate better as an industry
2. We will work smarter with our communities
3. We will protect our neighbours
4. We will help our neighbours sleep better
5. We will have Canada's quietest fleet
6. We will do more to understand our impacts
7. We will limit surprises
8. We will continue to take care of the environment
9. We will lift up our communities
10. We will always look for opportunities to improve



How Runways Operate at Toronto Pearson

Toronto Pearson has five runways, each of which can be used in two directions. Runway configurations are chosen based on runway availability, capacity needs and weather conditions.

East/West Runways

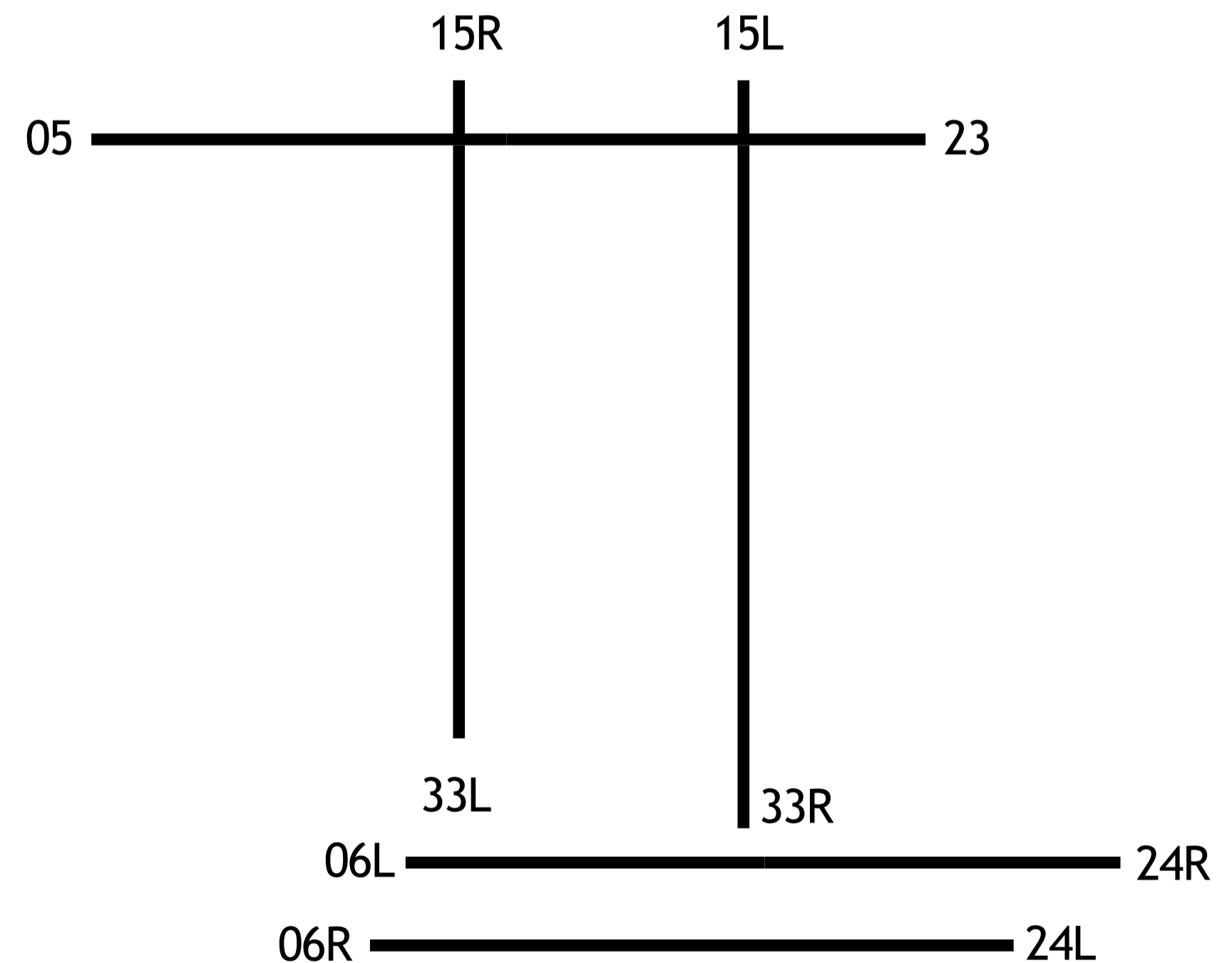
05/23
06R/24L
06L/24R

North/South Runways

15R/33L
15L/33R

The runways can be used in a two different operating modes:

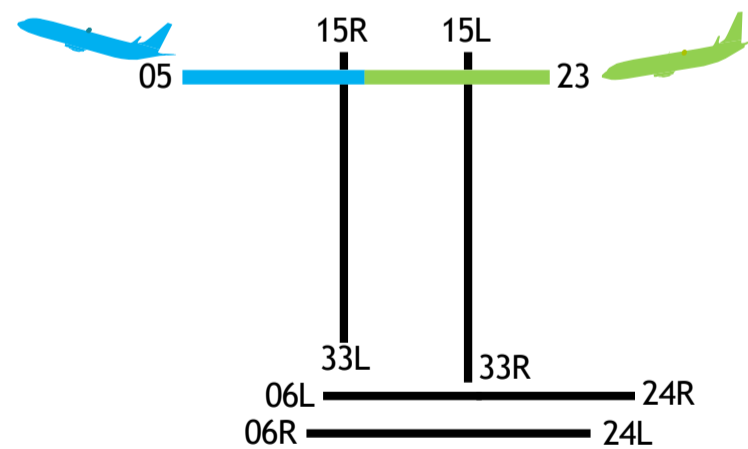
- Dedicated mode: when a runway is used exclusively for arrivals or departures
- Mixed mode: when the same runway is used for both landings and departures at the same time



Runway Configurations Pearson

Single/Straight

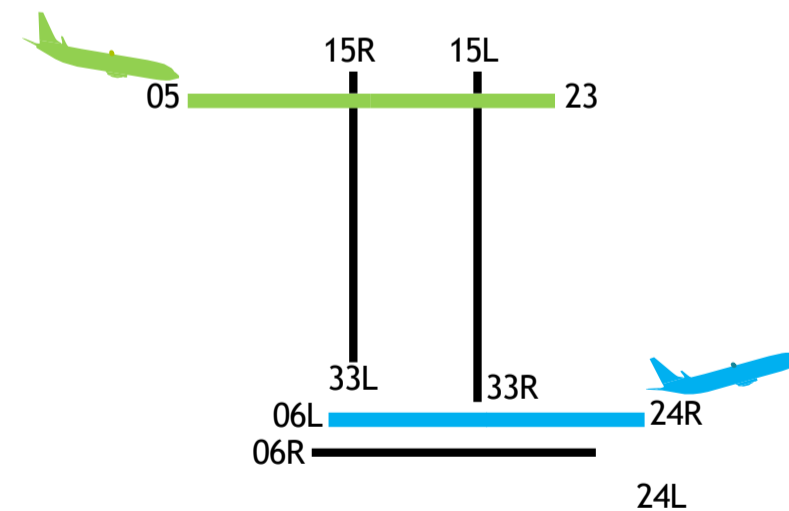
When just one of our five runways is used to support a mix of arrivals and departures.



Land 1/Depart 1

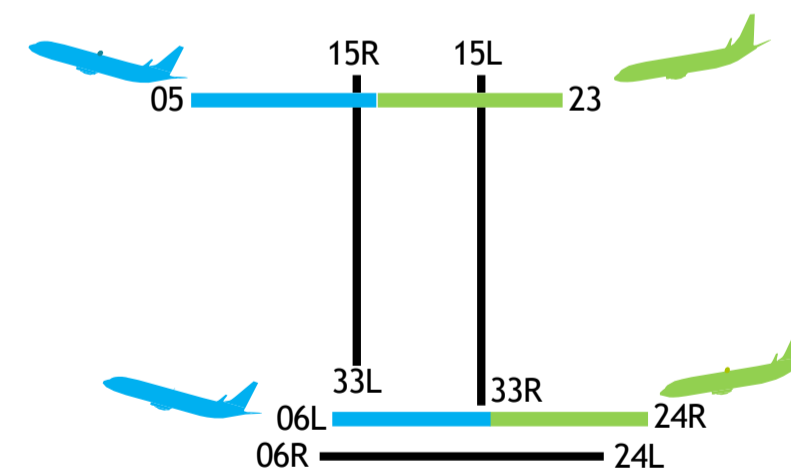
When one runway is used for arrivals, and the other for departures.

At times, to accommodate traffic the dedicated departure runway can also be used for arrivals when there are gaps in departure traffic. We call these offloads.



Dual

When two parallel runways are used simultaneously and independently with both runways being used in a mixed-mode.



Triple

When all three east/west runways are used, with one runway used in a mixed-mode and the other two in dedicated-modes.

