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# NOISE MITIGATION USING PBN

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# NOISE MITIGATION USING PBN

- › PBN does bring potential challenges with concentration, but this concentration can also be a valuable noise mitigation tool if used appropriately
- › Concentration not always the right solution, so 'hybrid' procedures can provide balance between PBN gains and dispersion where required
- › PBN approach procedures will result in better CDO performance. The resulting increase in altitude providing noise mitigation

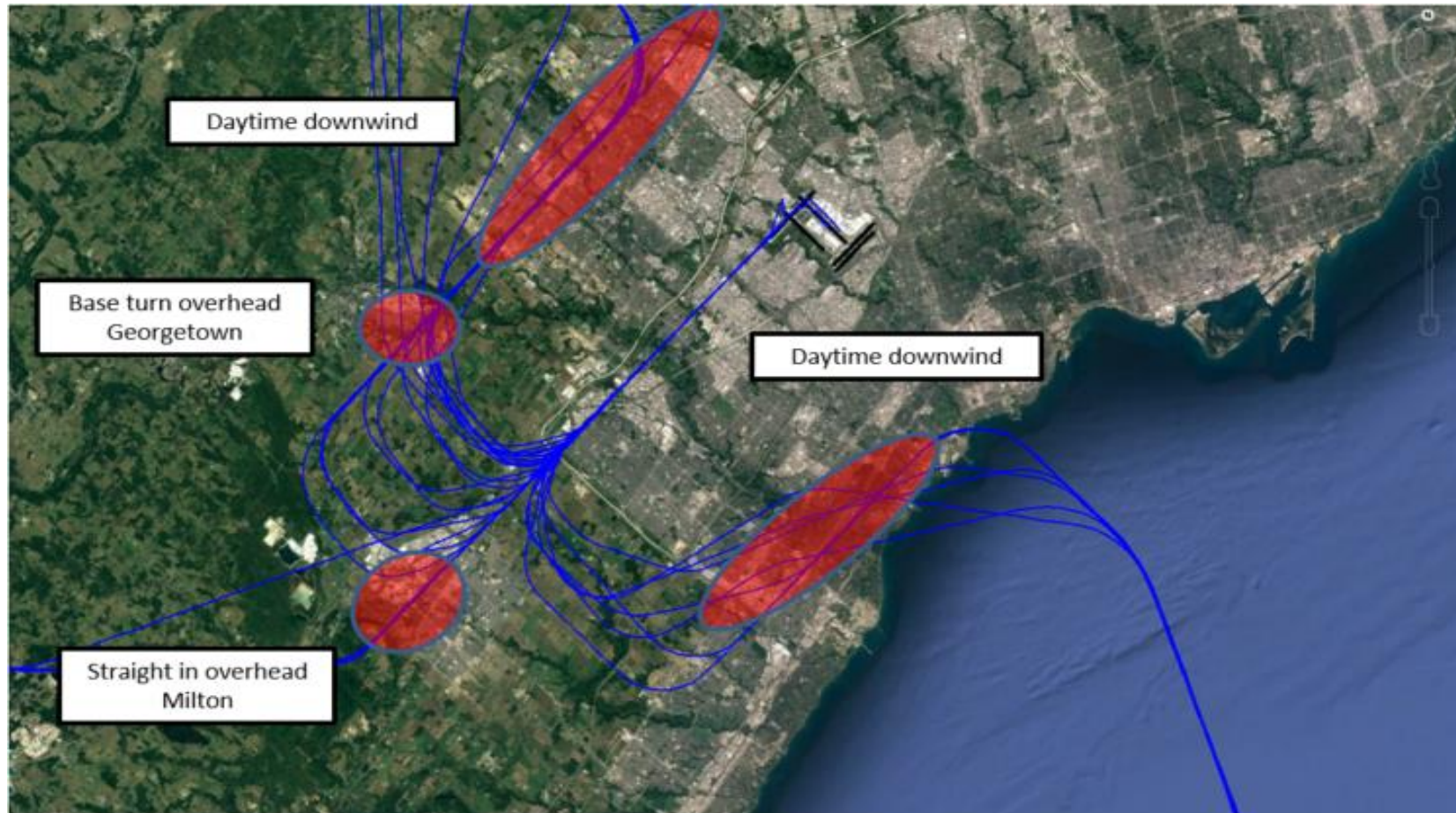
# NIGHTTIME RNAV ARRIVALS - TORONTO PEARSON

## Goal

- Minimize use of the downwinds at night
- Create RNAV approaches that incorporate quieter, continuous descent to the runway
- Design approaches to overfly greenbelt and industrial areas, where possible
- Ensure designs are user friendly for both ATC and customers, to maximise usage

# NIGHTTIME ARRIVALS

## EXISTING RWY 05 OPERATION



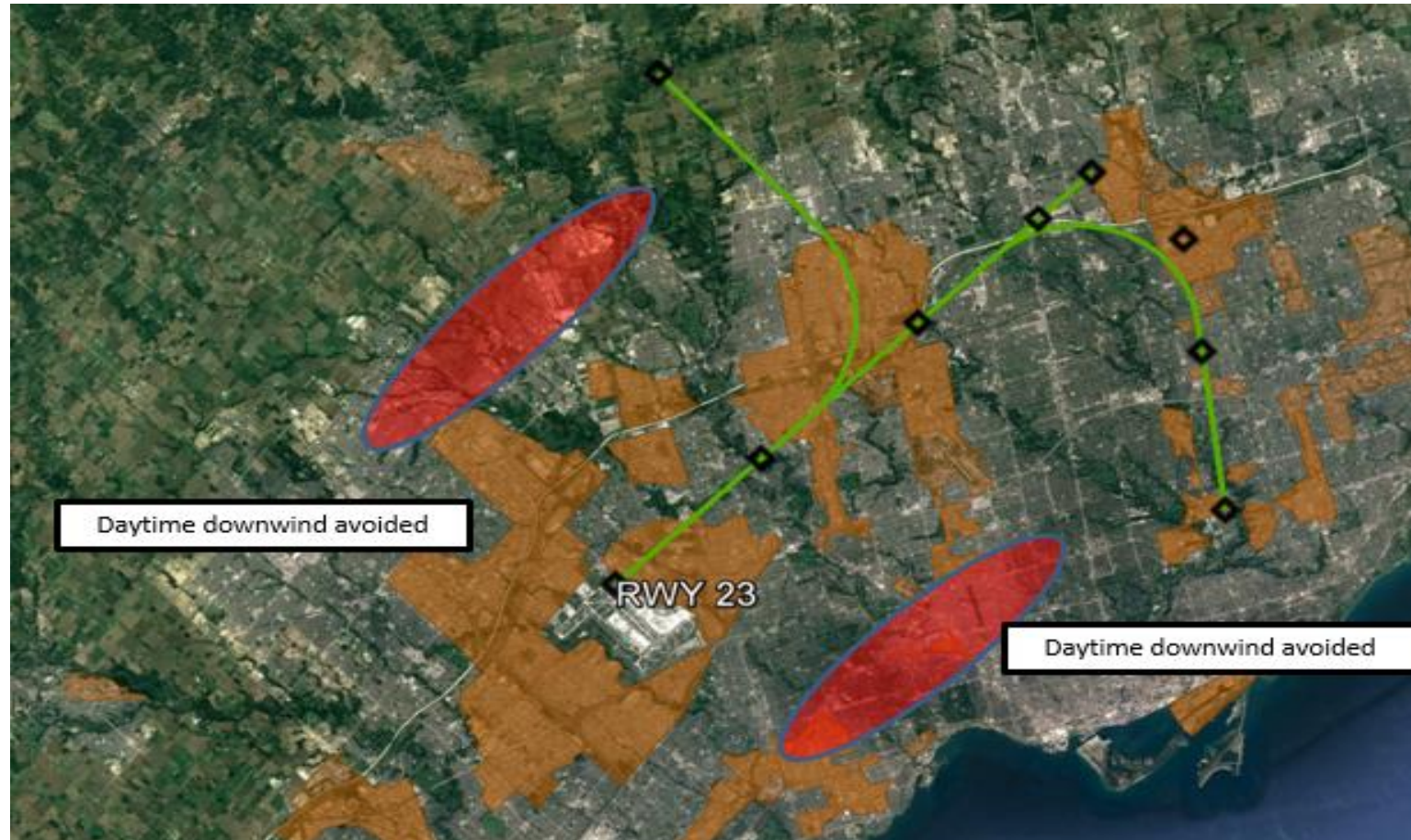
# NIGHTTIME RNAV ARRIVALS

## NEW RNAV DESIGNS - RWY 05



# NIGHTTIME RNAV ARRIVALS

## NEW RNAV DESIGNS – RWY 23



# NIGHTTIME RNAV ARRIVALS

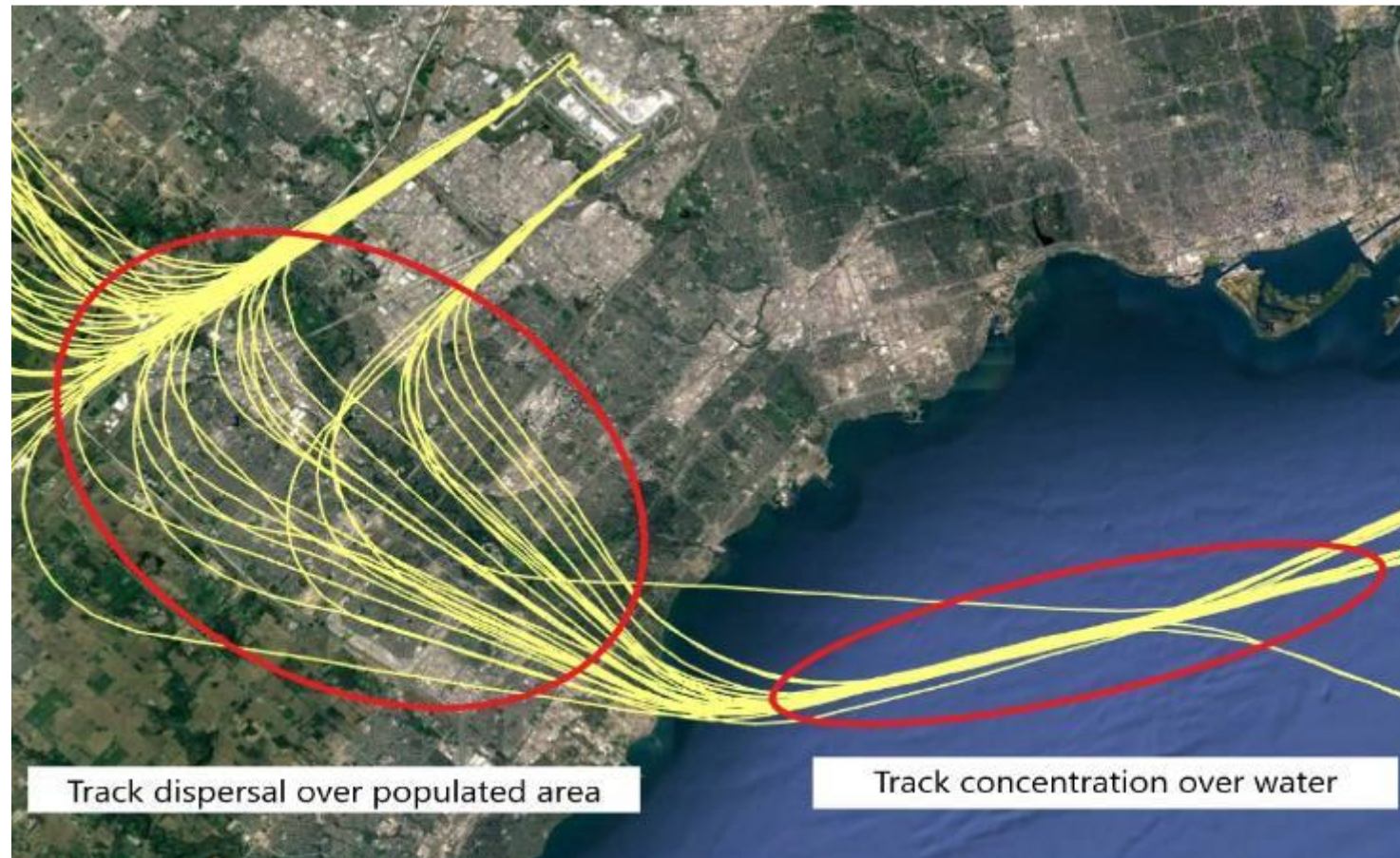
## NEW RNAV DESIGNS – RWY 23

- Changes in population overflown\*
  - 55 dB – 42% reduction (268,700 less people)
  - 60 dB – 30% reduction (80,830 less people)
- Changes in number of houses overflown\*
  - 55 dB – 125,800 less houses
  - 60 dB – 36,960 less houses

\*Comparison between average/most common existing night approach and Concept RNAV based on 2011 Census data

# HYBRID RNAV SIDS

WHEN CONCENTRATION ON INITIAL CLIMB IS NOT VIABLE





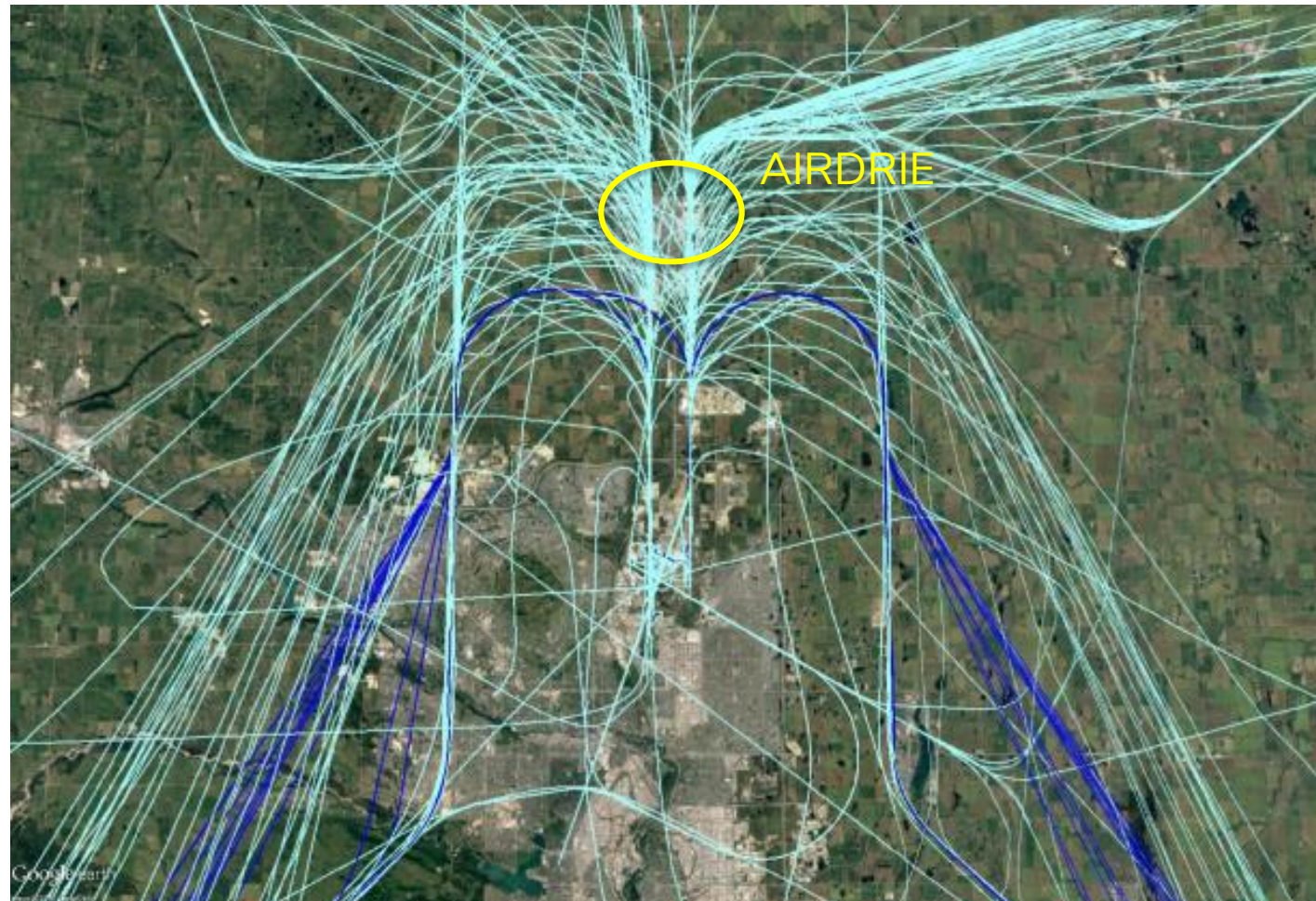
# RNP-AR APPROACHES - OTTAWA

## CONCENTRATING AWAY FROM COMMUNITIES



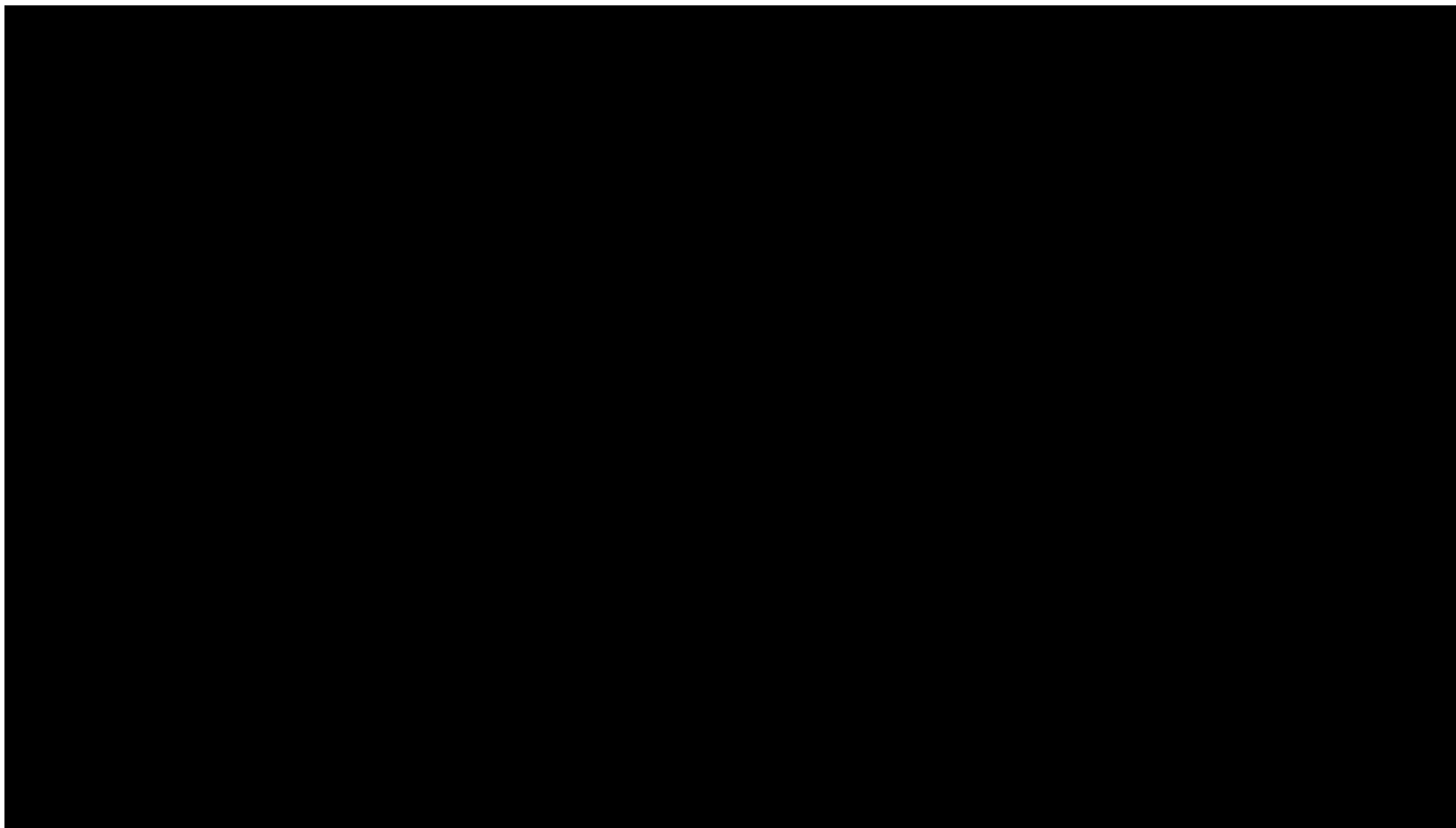
# RNP-AR APPROACHES - CALGARY

## AVOIDING AN ENTIRE COMMUNITY



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## EOR VIDEO



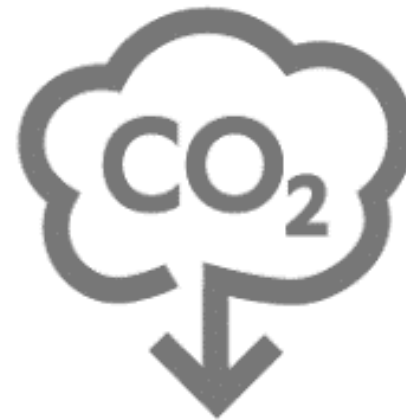
## REAL WORLD RESULTS: PROVIDING CONTEXT

- › Importance of telling the story.
- › Positive changes should be communicated proactively.



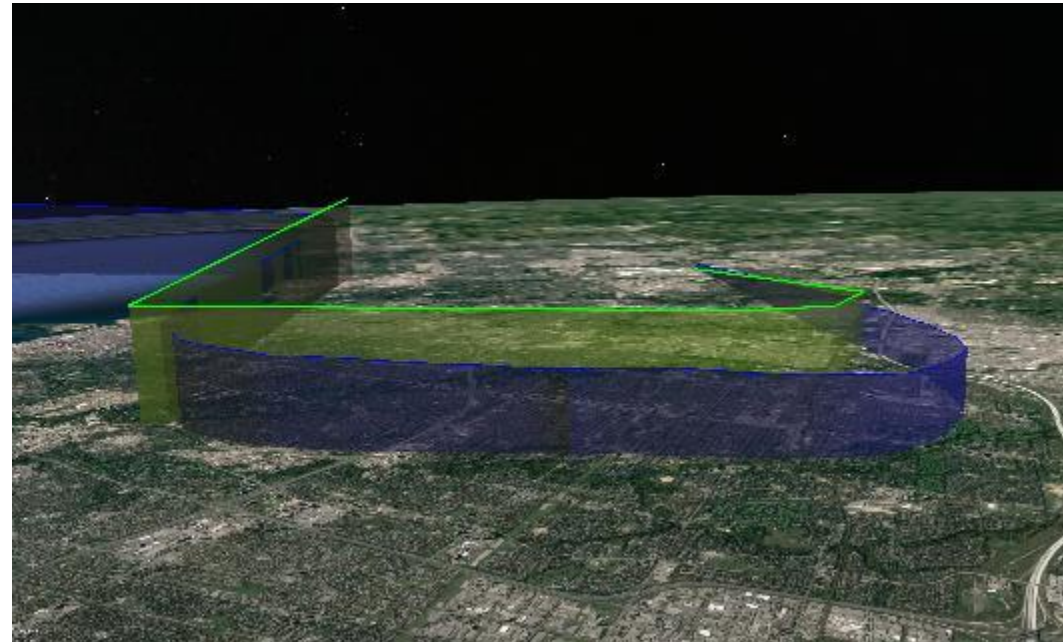
## REAL WORLD RESULTS: COMMUNITIES

- › Measured decreases in noise levels.
- › Reduced emissions.



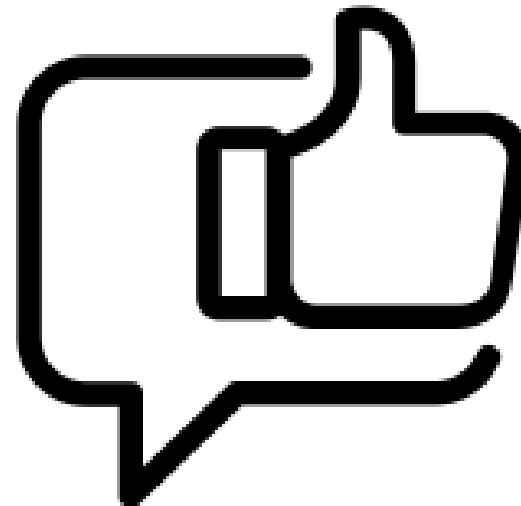
## REAL WORLD RESULTS: COMMUNITIES

- › Reduced low altitude leveling.
- › Aircraft are higher.



## REAL WORLD RESULTS: COMMUNITIES

- › No complaints associated with changes.
- › Growing narrative of support.



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## REAL WORLD RESULTS: STAKEHOLDERS

- › Airline customers are on our deployment teams and promoting benefits to other audiences.
- › Airports are now our partners on deployment.
  - Many are developing more robust Noise Management Action Plans and see our application of PBN as a solution.
- › Elected officials are telling us that this is the right way to do things.





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# QUESTIONS

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