Stakeholder Engagement and Performance-Based Navigation as a Noise Mitigation Platform

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Spurred by growing levels of aviation activity, regional and global environmental commitments, technology advancement, and industry economics, airspace modernization is no longer optional. This is the context in which Air Navigation Service Providers (ANSP) are compelled to drive forward providing safety, efficiency, and environmental gains in order to deliver value to a varied set of stakeholders. Finding common ground between industry and communities and their elected representatives can be challenging. Expectations from stakeholders have increased and, as a result, the need for effective community and stakeholder engagement is now the path to airspace change success.

EMPLOYING A STAKEHOLDER-CENTRIC APPROACH

A key component of successful airspace deployment for NAV CANADA is one that place with stakeholders at the heart of the process, going from the ground up. Deployment teams are formed, comprised of airspace designers, air traffic control staff at the facilities in question, operations project managers, and members of the stakeholder relations team to proceed with airspace development. They work together towards a common goal of reducing airspace complexity, improving safety and accessibility, delivering efficiencies, and generating environmental gains. Airline customer representatives also participate in early concept of operations meetings so that the project team understands operational requirements, cockpit/workload processes and factors, flight management system characteristics, and aircraft performance limitations. This helps ensure operational feasibility and efficiency while anticipating future pilot awareness and training needs.

The design process is informed by design criteria and operational constraints, but goes a step further by considering community impacts from the outset. In this manner, airspace design is not just considered against a controller's situational display, but also by the relative location of neighboring communities. This is done by plotting potential procedures against satellite imagery and seeking opportunities to place tracks over commercial, industrial, and other non-residential use land. In addition, noise modeling is used to understand how many people are affected by a proposal with an objective of developing a concept of operations that reduces noise impacts. The result is a draft proposal that is cognizant of community impacts while meeting operational objectives and constraints. The cross-functional nature of the airspace project teams has resulted in increased flexibility in stakeholder and community engagement, with technical staff having a better understanding of how to approach public events. It also gives stakeholder relations/public affairs staff knowledge about technical matters so that they are better positioned to tell the airspace change story in a factual and relatable manner.

With a draft concept of operations, the project team will meet with airport operations and community affairs representatives to discuss impacts and potential further enhancements given the airport's front-line knowledge of noise sensitive areas. Further adjustments are made to designs and the associated noise modeling, prior to community engagement planning

which is developed in lockstep with the concerned airport authority. The active participation of airports in the design process can result in better design outcomes because it allows them to contribute their on-site knowledge regarding current noise exposure, identification of noise sensitive areas, and other community concerns.

FOUNDATION FOR EFFECTIVE ENGAGEMENT: AIRSPACE CHANGE PROTOCOL

In Canada, airspace community engagement methodologies are guided by the industry's Airspace Change Communications and Consultation Protocol. The voluntary protocol was developed in 2015, and co-signed by NAV CANADA and the Canadian Airports Council, and endorsed by the Canadian Minister of Transportation. The protocol outlines when and how consultation should occur, with a consultation methodology that is largely informed by community impacts. The Airspace Change Protocol sets thresholds that help determine if consultation or communications processes should occur. This includes quantifiable thresholds related to the number of aircraft movements at the airport, the altitude at which flight path changes are anticipated (lower altitude flight have the potential for greater impacts), and anticipated increases in procedure utilization with considerations for nighttime operations. While many of the projects that are guided by the protocol are related to airspace design, it also seeks to guide major airport projects that can impact runway utilization or drive changes in air traffic flows.

Regardless of whether consultation is required or not, the protocol promotes proactive notification efforts and the availability of comprehensive information on the proponent's website and is distributed through the airport's various communication channels. Another fundamental tenet of the protocol is the importance of air navigation service (ANS), airport, and airline participation and collaboration in shaping and conducting airspace change. In this manner, it is not unusual for representatives of the ANS, airports, and airlines to participate at community events to ensure a more holistic understanding of the various facets of operations.

COLLABORATING ON ENGAGEMENT

NAV CANADA works directly with airport authorities to define public consultation and engagement processes that are sensitive to the community and socio-political environment at any given location. The project team will propose an engagement format that may include events such as public open houses, notice processes, earned media considerations, and informative web content. The format is discussed with the airport authority and events will be added, promotion activities will be adjusted, and messaging considerations will be shaped according to the airport authority's feedback. This ensures that both parties are aware of how communications will occur and that it happens in a coordinated fashion, the details of which are elaborated in an Engagement Plan. At this phase, the project team will involve a key stakeholder – the airport's noise management committee – to brief them on the proposed airspace changes and seek the committee's input on potential improvements and possible community engagement mechanisms.

CASE IN POINT: TORONTO PEARSON AND THE "6 IDEAS"

In the spring of 2018, NAV CANADA and the Greater Toronto Airports Authority (GTAA) consulted on a series of 6 ideas with communities surrounding Toronto Pearson, the busiest airport in the country. The ideas sought to deliver potential mitigations both close to and further away from the airport. NAV CANADA proposals included: new nighttime RNAV procedures, new nighttime departure procedures, and updates to Standard Terminal Arrivals. In parallel, the GTAA proposed a Summer Weekend Runway Alternation trial and enhancements to the nighttime preferential runway system. Noise modeling demonstrated that as many as 220,000 fewer people would be impacted by the new nighttime procedures at noise levels above 60 dBA when compared with the current, typical flight profile. The joint consultation represented a significant collaboration between the two stakeholder groups by bringing a package of mitigations that could work in concert and proposed in partnership, shoulder to shoulder.

A significant promotion effort was brought forward by the airport authority and executed in partnership with NAV CANADA, including: newspaper notices, paid and organic social media promotions, automated telephone notifications, and a comprehensive web package. These actions surpassed requirements of the protocol and ensured that communities were aware of their opportunity to participate in the process. A series of 19 public open house style consultation events were held across the Greater Toronto Area, two of which had a livestream capability for those who could not attend one of the in-person sessions. A key feature of the events was that the provision of information went beyond information boards and staff, to include address lookup stations. These allowed residents to provide their address or postal code and receive an interpretive briefing as to what they can observe currently and what they can expect under the proposal. This was done using Google Earth with flight track data and noise modeling to illustrate operations and impacts over very specific locations.

Overall, hundreds of residents participated and provided feedback, either in person or through an online feedback tool. Subsequent to the consultation, a report was produced that: showed that communities broadly supported implementation, responded to feedback where appropriate, and provided an overview of implementation plans. Since the completion of the consultation process, all of NAV CANADA's proposed procedures have been phased in, including new night procedures that were implemented in November 2018, and new STAR profiles that enable increased Continuous Descent Operations were implemented in February 2019. Utilization rates of the new nighttime procedures have been high to date, while results for the new STAR profile are as anticipated and expected to increase over time.

PERFORMANCE BASED NAVIGATION (PBN) AS A DRIVER OF POSITIVE CHANGE

As shown in the example above, the industry needs to work together to turn the corner on negative perceptions towards PBN. This can be achieved by utilizing PBN and hybridization to achieve airspace objectives while delivering benefits to residential communities. When design teams actively consider how CDO, route placement, and the combination of PBN and vectoring can be leveraged, outcomes are improved. When that process is combined with effective education, consultation, and engagement, PBN-based navigation is no longer the source of uncertain opposition but the potential for positive change for communities and industry stakeholders alike.

Over the past four years, NAV CANADA has been leading this positive change throughout its airspace projects. It has employed Required Navigation Performance-Authorization Required (RNP-AR) to reduce the number of people impacted by noise by targeting non-residential areas at several Canadian airports. In some cases, vectors off the ground have been used to connect up with an Area Navigation (RNAV) Standard Instrument Departure (SID), to deliver the operational benefits of PBN, while minimizing impacts at lower altitudes. More recently, after significant work with partners at ICAO, NAV CANADA has improved traffic integration at Calgary International Airport by being among the first to leverage the Established on RNP-AR standard. Close to 3,000 aircraft are approaching on continuous descent per month, reducing low level altitude flying over communities by 140 hours per month, and reducing greenhouse gas emissions by 1,000s of metric tons. On an annual basis, 36,000 RNP-AR approaches at Calgary International will result in a reduction of 4.1 million kilograms of CO_2 emissions from reduced fuel burn, and will reduce use of low altitude levelling over residential areas by more than 1,500 hours.

These are just a few ways that PBN is being used as a source for noise mitigation, combined with transparent engagement, to deliver on NAV CANADA's mandate and generate value for stakeholders.

ICAO

CHAPTER THREE

Local Air Quality