2015-2016 Yellow U23 SMART Approach Flight Path Trial

Draft Report 2017

Presentation to ANCCG
26 October 2017

Aviation influence, roles and responsibilities

International Civil Aviation Organisation (ICAO)

- Specialist agency of the UN responsible for the safe & orderly development of the world's aviation industry.
- Sets standards and regulations necessary for aviation safety, efficiency and regularity.

Ministry of Transport

- NZ Government's principal transport advisor.

Civil Aviation Authority of New Zealand

- Regulates civil aviation in NZ and enforces ICAO's standards and regulations to the extent they are incorporated into relevant NZ legislation.
- Develops Civil Aviation Rules (CARs) under the Civil Aviation Act 1990 and how these govern how aircraft manoeuvre in NZ.

Airways Corporation of New Zealand

- Manages 30m square kilometres of airspace, providing air traffic control, surveillance, communication, flight inspections, mapping and airspace design services.
- Designed Yellow U23 SMART Approach flight path and its procedures, and integrated SMART and non-SMART aircraft using Auckland Airport.

Aviation influence, roles and responsibilities

Board of Airline Representatives New Zealand Inc (BARNZ)

- An incorporated society comprising 28 member airlines and represents their interests across airport pricing & capital expenditure, government departments & agencies, and noise issues around airports.
- Represented airlines using Auckland Airport during the Yellow U23 trial.

Airports

- Provide the infrastructure for aircraft to land & take off and facilities for processing passengers as they arrive and leave.
- Auckland Airport agreed to the Yellow U23 instrument flight procedures and responds to public concerns about aircraft noise.

Airlines

- Operate under NZ's Civil Aviation Rules, set own standard operating procedures and comply with aircraft certification and operating requirements.
- Five participated in Yellow U23 trial: Air NZ; Jetconnect; Virgin Australia; Jetstar & Emirates.

Pilots

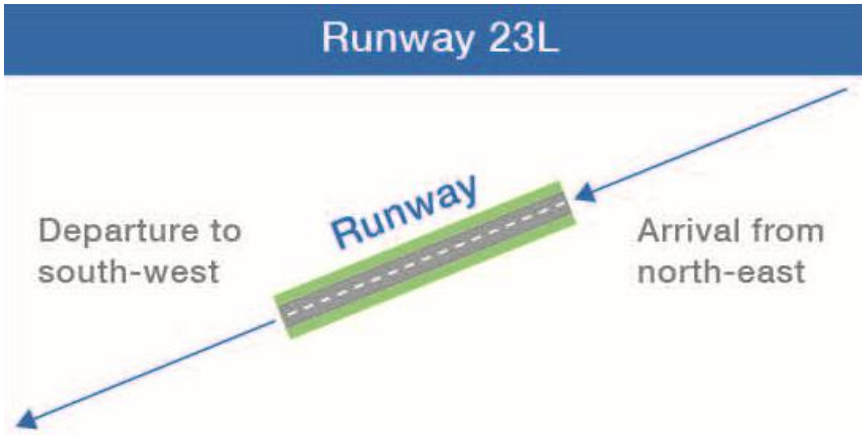
- Adhere to SOPs but retain aircraft operational authority & discretion.

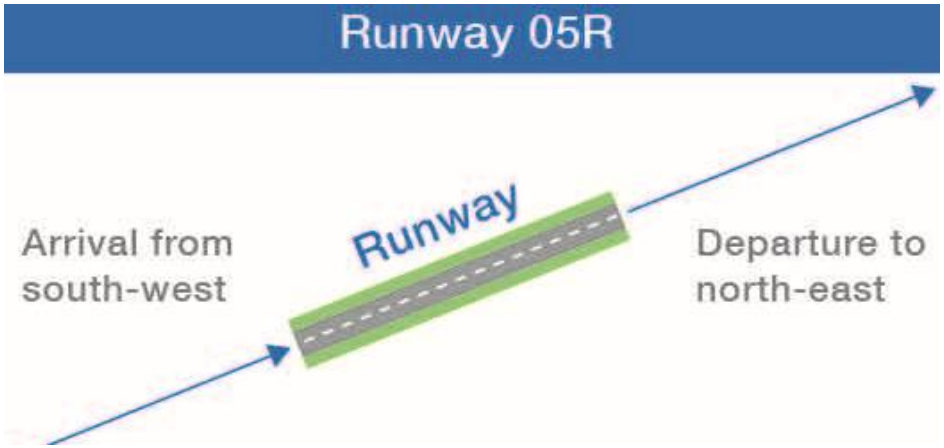
Legal framework for NZ aviation

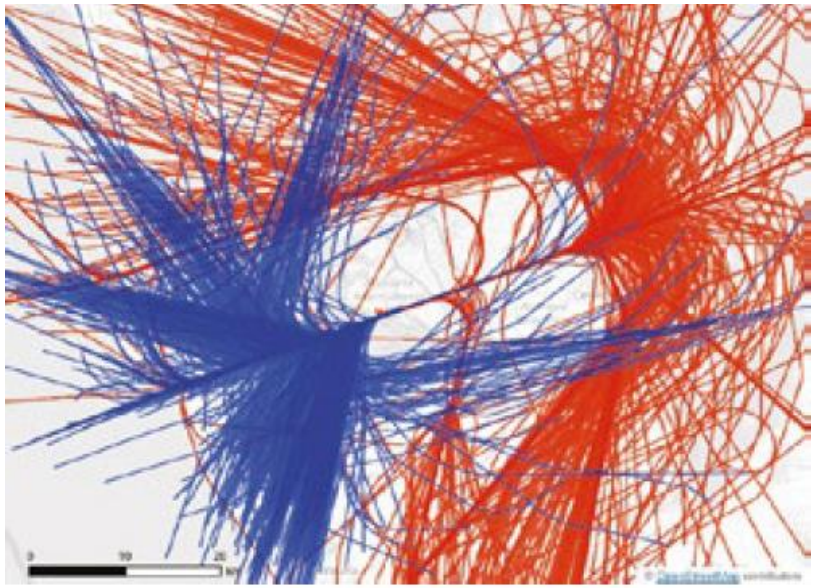
Acts, Plans and Rules regulate aviation, including:

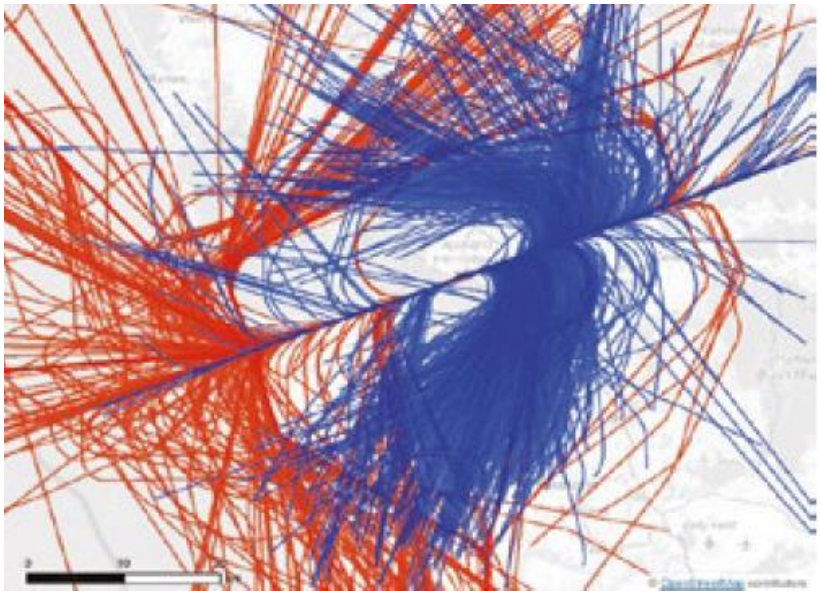
- Civil Aviation Act 1990
- Civil Aviation Rules
- Resource Management Act 1992
- Auckland Unitary Plan

Flights into Auckland







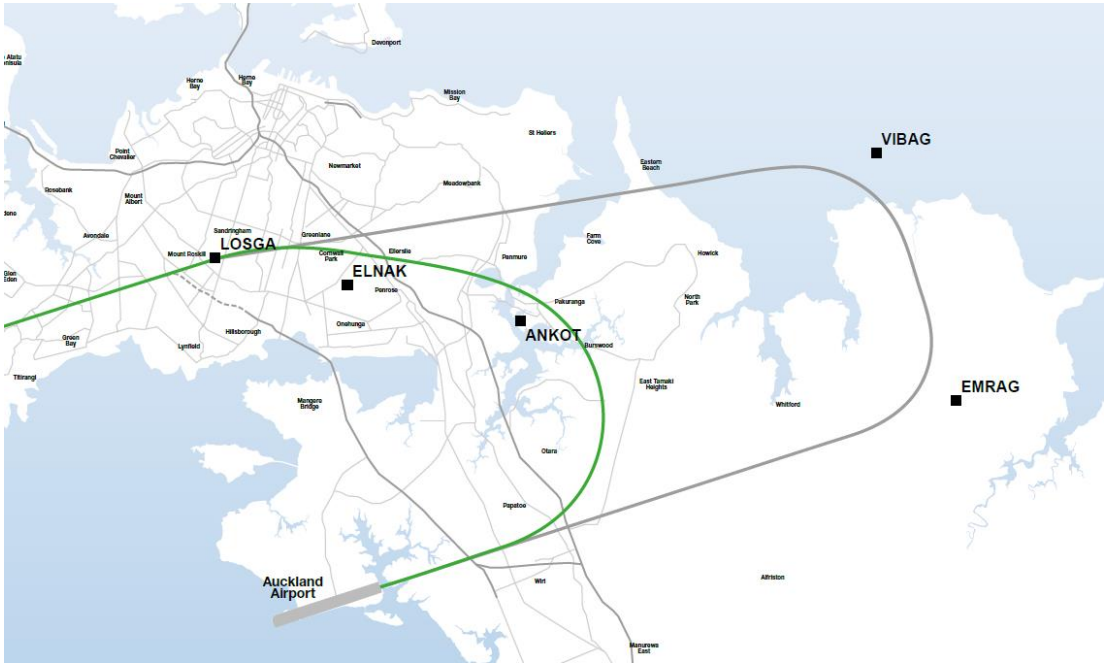


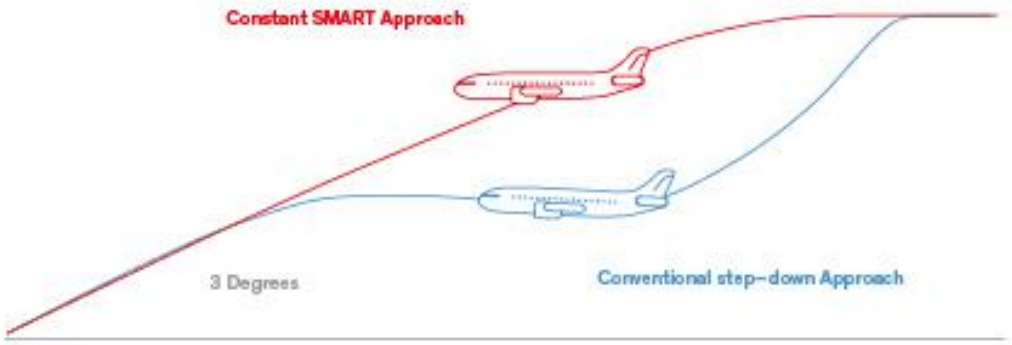
SMART Approaches

Global initiative which uses satellite navigation technology for approaches & departures

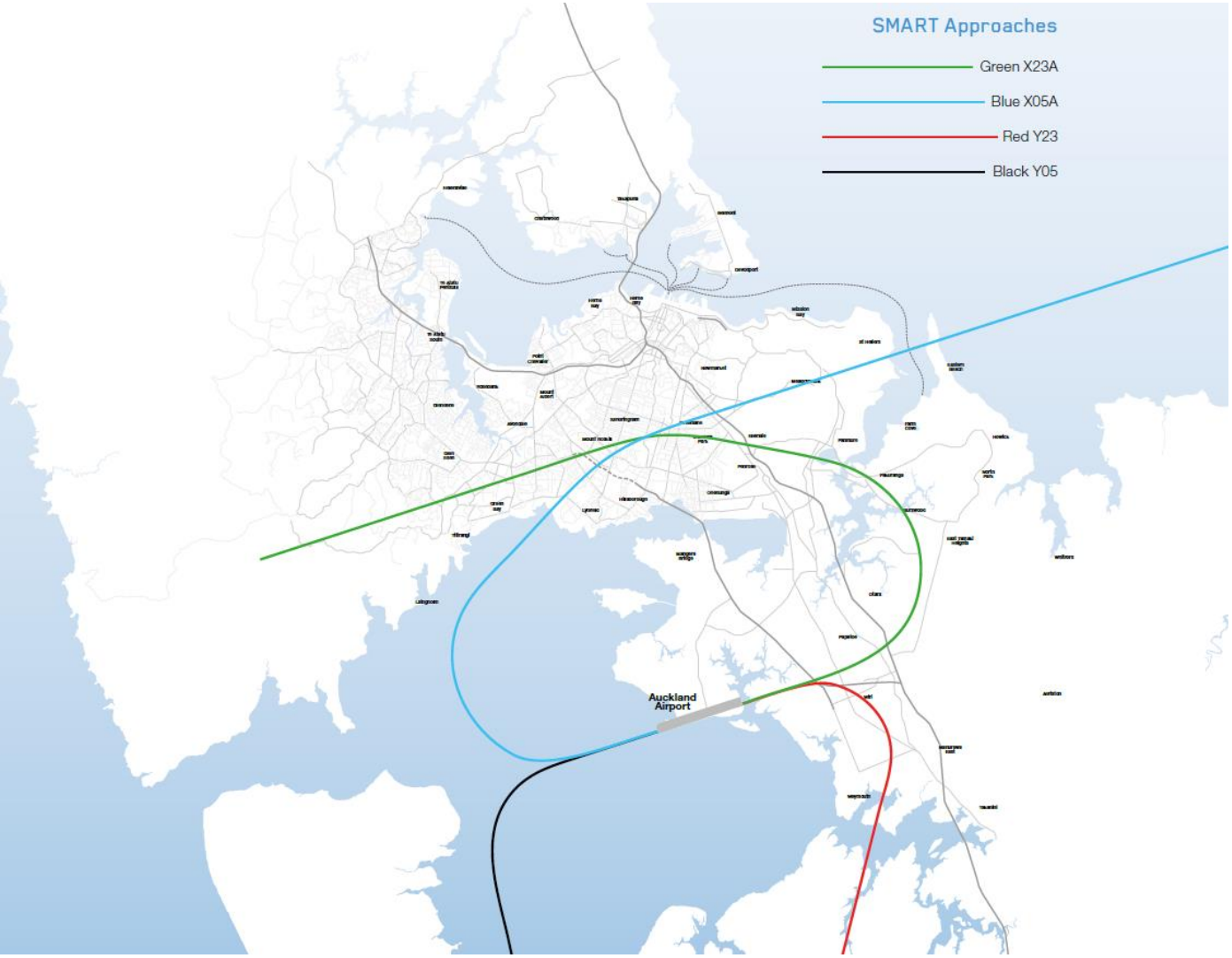
- In 2007 ICAO urged member countries to move to performance based navigation (PBN) (SMART Approaches)
- NZ agreed in 2011 and PBN is a key component of National Airspace Policy and National Airspace and Air Navigation Plan – New Southern Sky.
- Since 2003 in Queenstown and since 2012 in Auckland.
- Enable curved approach paths to the runway, so aircraft establish on the extended runway centreline much closer to runway than possible using ground based instrument landing systems.
- Reduce aviation congestion, conserve fuel, protect the environment, maintain reliable all-weather operations.
- Less aircraft noise and shorter flight paths, resulting in fewer residents being overflown.

SMART Approaches



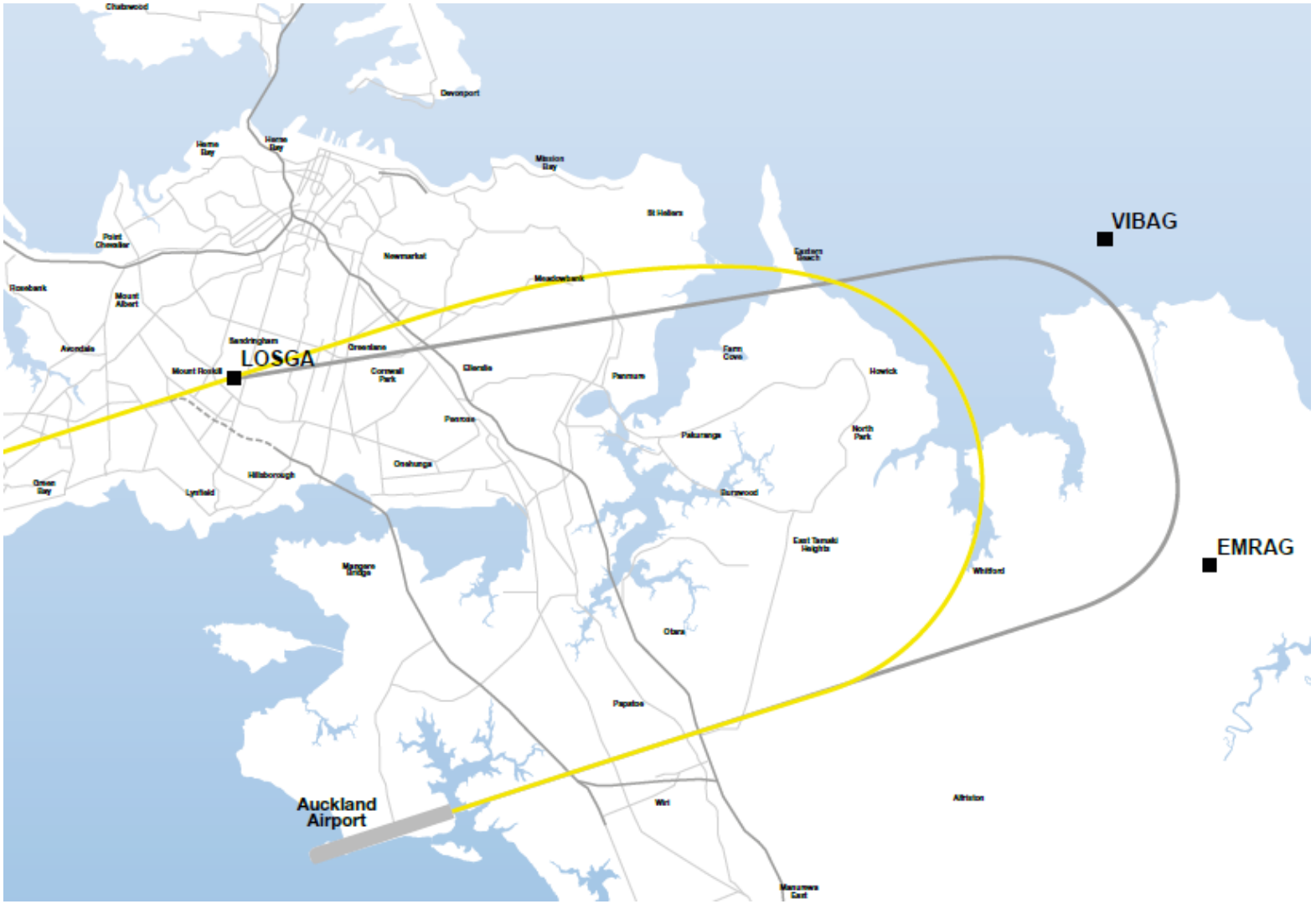


Auckland's SMART Approaches



- 4 SMART Approaches
- 2 from north and 2 from south
- BlackY05 implemented in 2011.
- 2012-2013 trial and public consultation on GreenX23, BlueX05 and Red Y23.
- BlueX05A & GreenX23A: 7am-10pm and 10 per day max.
- Red Y23 & BlackY05: 24 hrs per day & uncapped.
- Trial of a third SMART Approach from the north to Runway 23L (Yellow U23) signalled in 2012-2013 Trial Report in December 2014.

2015-2016 Yellow U23 Trial



2015-2016 Yellow U23 Trial

- Why? Higher demand for Runway 23L approaches; future demand would exceed Green X23A's cap of 10 flights per day.
- Incorporated lessons from 2012-2013 trial and was designed higher and approach curve wider than trialled flight paths.
- Followed a long-established visual arrival flight path / STAR but SMART aircraft required to pass over LOSGA at or above 6,000ft (1,000ft higher than other aircraft using the STAR), so quieter.
- Only CAA approved airlines and A380, A320, B737, B777 & B787 aircraft with qualified crews permitted to fly trial flight path.
- Trial: Sept 2015–Aug 2016; 7am-10pm; max 10 flights p/day.
- Sought to evaluate aircraft performance; airspace management; operational benefits – including time, distance, fuel savings and carbon emissions; noise monitor results and public feedback.
- Media releases & newspaper ads before, during and after trial.

Yellow U23 Trial Results: Use

Month	Number of Yellow U23 SMART Approaches
SEP 2015	19
OCT 2015	31
NOV 2015	25
DEC 2015	18
JAN 2016	15
FEB 2016	0
MAR 2016	0
APR 2016	19
MAY 2016	65
JUN 2016	113
JUL 2016	80
AUG 2016	55
TOTAL	**440**

Initial uptake of the Yellow U23 by airlines was slow due to:

- aircraft operating systems only allowing pilots to load two possible approaches from the north and west, one of which was required to be the conventional instrument landing system approach. Initially, almost all pilots chose the shorter Green X23A as their second approach
- between Feb and Mar 2016 there was runway maintenance at Auckland Airport which caused a reduction in the length of runway available for aircraft landing from the west.

The Yellow U23 SMART Approach was used most frequently in June and July 2016.

On the busiest days (18 & 19 June) 9 Yellow U23 approaches were flown.

The maximum combined number of approaches flown across Yellow U23 and Green X23A was 16.

Yellow U23 Trial Results: Airways feedback

Airways' key trial objective was to ensure that the Yellow U23 SMART Approach flight trial procedures could successfully be developed and safely integrated into the existing air traffic management system without affecting the pre-existing airport and airspace capabilities.

Airways' feedback included:

- The trial successfully met its eight key objectives.
- The 440 flights flown saved 3,175 nautical miles of distance; a total of 76,536 kilogrammes of fuel was not burned; there were 241,852 kilogrammes of reduced carbon emissions.
- An average of 44 flights per month used Yellow U23.
- All Yellow U23 SMART Approach flights operated within the daily time window of 7am to 10pm.
- The permitted number of daily flights (ten) was never exceeded.

Note: A detailed summary of Airways' feedback is in the publication *Airways New Zealand Uniform SMART Approach Trial Report* which can be found online at:
www.aucklandflightpathtrial.co.nz

Yellow U23 Trial Results: BARNZ feedback

Trial purpose was to assess two key operational elements:

1) performance of aircraft flying the approaches in various weather conditions across a year

2) How effectively Airways would be able to utilise the SMART procedure and merge SMART and non-SMART aircraft onto the extended centreline, while ensuring that runway capacity (aircraft movements p/hr) wasn't adversely affected.

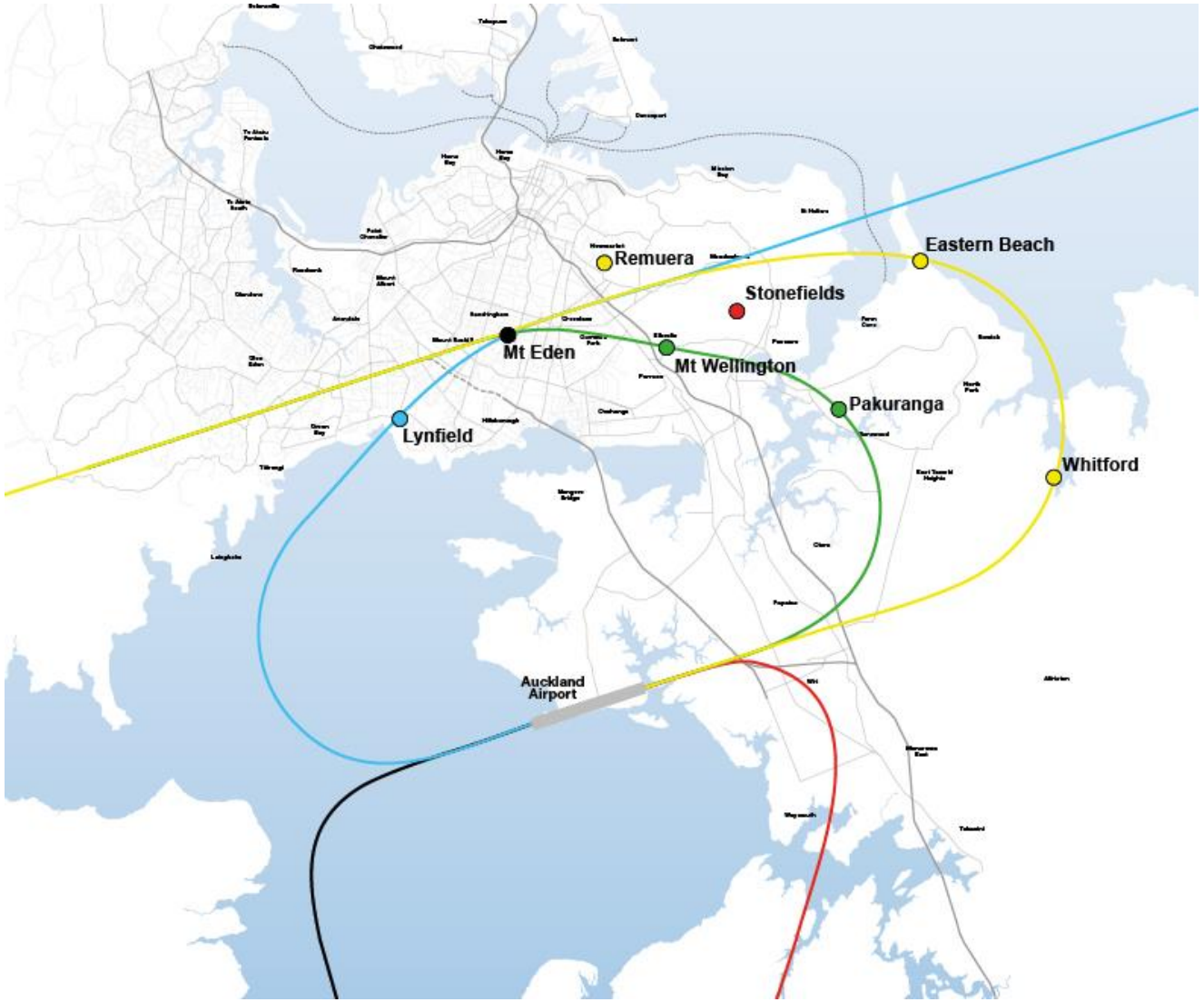
Airlines considered that the flyability for all aircraft types was acceptable and recommended no design changes.

The airlines considered:

- The objective of achieving a profile that delivers near idle engine power with minimal need for use of other noise-generating pilot actions (e.g. speed brake application) had been achieved by the procedure design.
- The reinstatement of trial procedures used from May 2016 – when pilots of participating airlines from certain destinations agreed to select Yellow U23 rather than Green X23A – would improve usage of the Yellow U23 SMART Approach flight path.

Note: A detailed summary of BARNZ' feedback is in the report *Auckland Uniform SMART Approach Trial Review* which can be found online at: www.aucklandflightpathtrial.co.nz

Yellow U23 Trial Results: Noise Monitor results



- Data gathered by noise experts Marshall Day Acoustics on behalf of Auckland Airport.
- 7 monitors in place prior to trial commencement.
- 1 more monitor added in April 2016 in Remuera following preliminary flight analysis.
- 4 monitors were located under or near the Yellow U23 SMART Approach flight path.

Yellow U23 Trial Results: Noise Monitor results

Using the measured single-event noise levels at each site, noise exposures (L_{dn}) were calculated for a day where 10 Yellow U23 SMART Approaches were operating and a day where no Yellow Approaches were operating.

These calculations are for aircraft noise only and do not include the general ambient noise (e.g. road traffic).

The findings of these calculations showed that the difference in the noise exposure (L_{dn}) was less than 1dB – or imperceptible – at most sites.

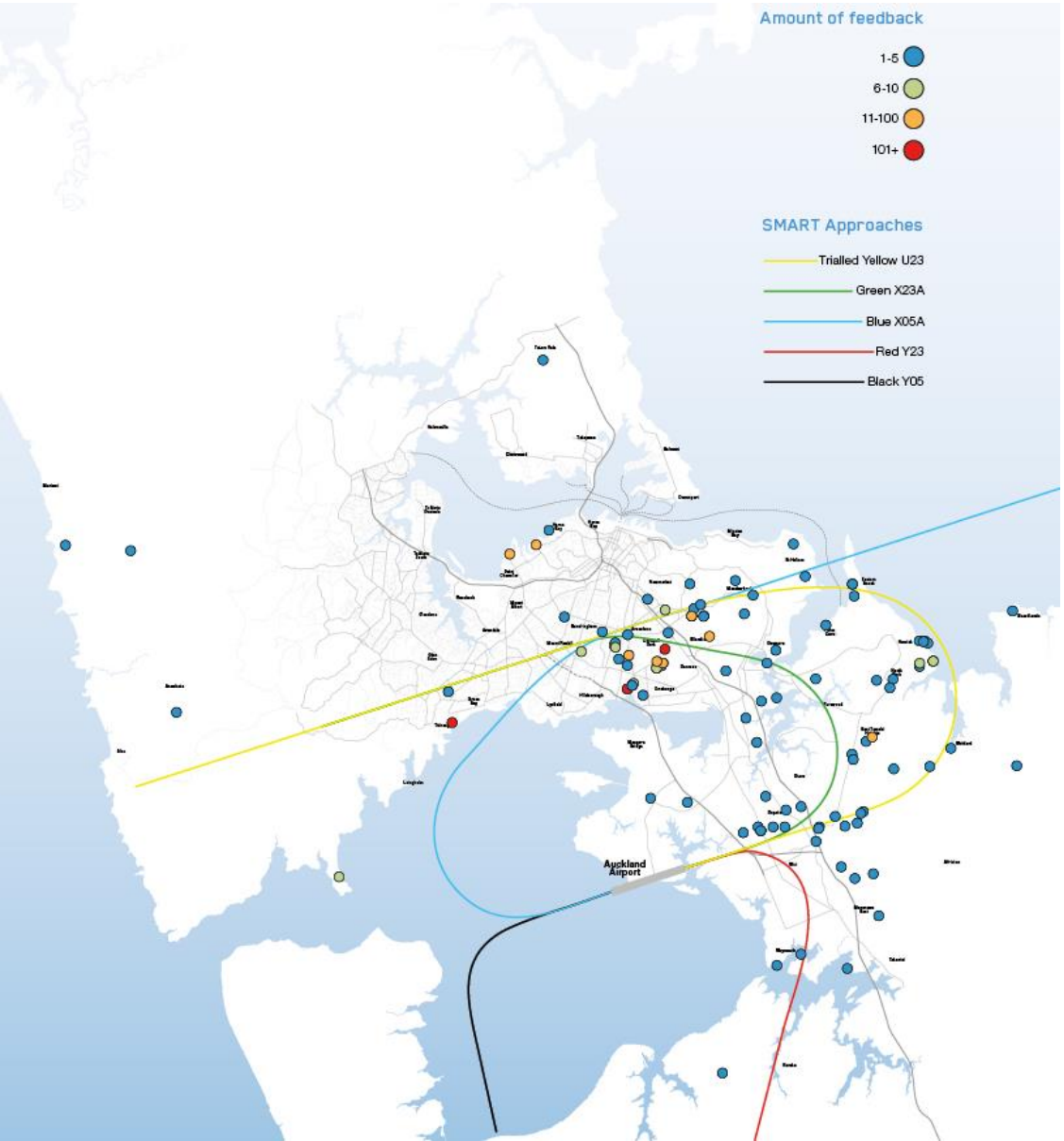
There were two exceptions:

- the Whitford noise monitor: the predicted difference was an additional 4dB (L_{dn}). This change in noise is described by noise experts as “just perceptible” and is not regarded as significant.
- the Remuera noise monitor: the predicted difference was an additional 2.2dB (L_{dn}). This change in noise is described by noise experts as “imperceptible” and is not regarded as significant.

At all the trial’s eight noise monitoring locations, the calculated L_{dn} noise exposure for aircraft was 35dB-40dB, or 10dB-18dB below the measured ambient noise (which comprises the background sounds present at a location).

Note: A detailed summary of MDA’s feedback is contained in the report *Analysis and Assessment of Effects (Yellow U23)* which can be found online at: www.aucklandflightpathtrial.co.nz

Yellow U23 Trial Results: Community feedback

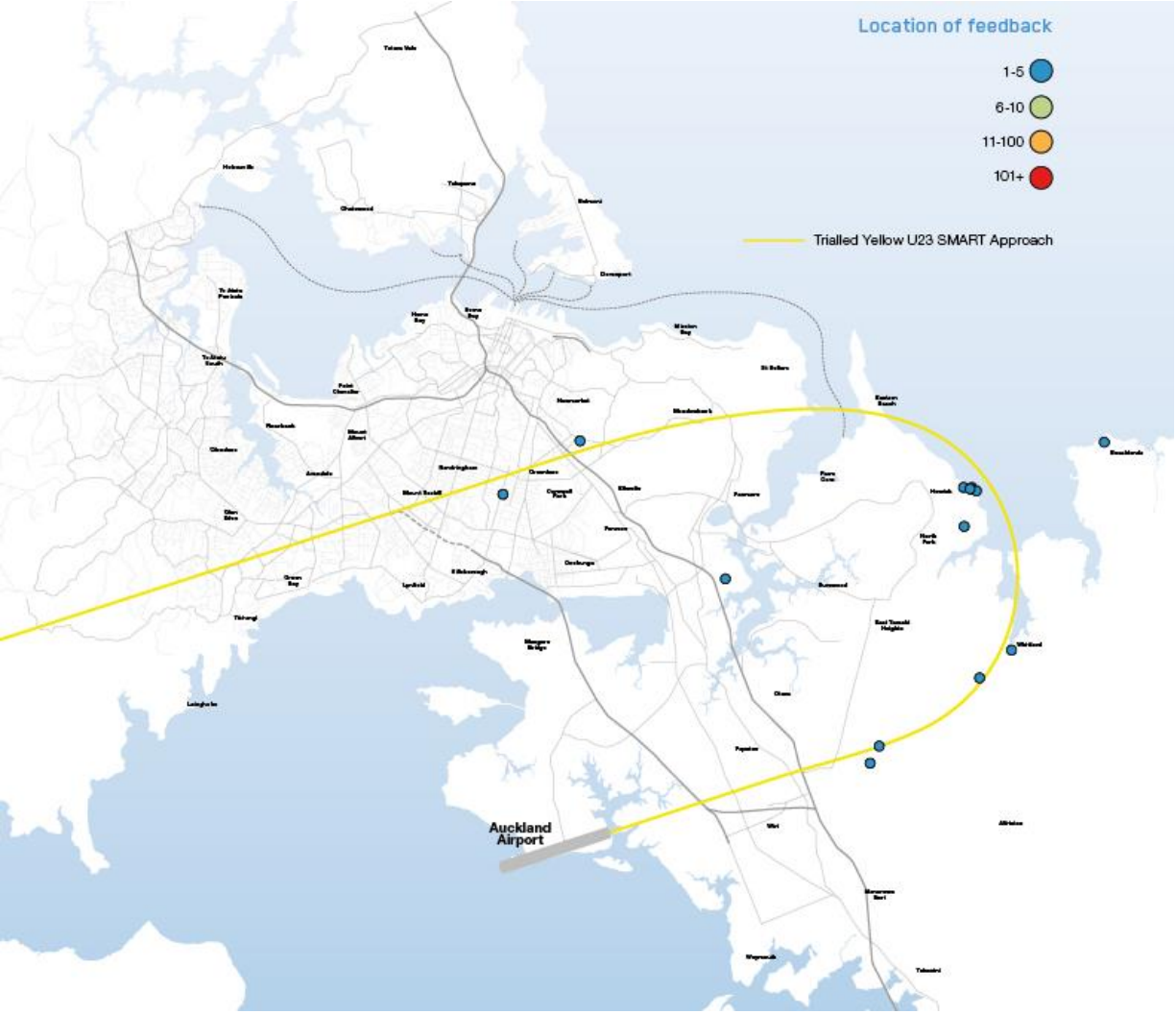


Between Sept 2015-Aug 2016, a total of 109 people provided Auckland Airport with aircraft noise feedback, on 1,724 occasions:

- 60% of all feedback was received from two people – both located in Onehunga, 3 kms from Yellow U23 but close to Green X23A.
- on 1,519 occasions (88%) feedback related to **specific aircraft events**, with 1% referencing Yellow U23 (15 comments provided by 8 people, one of whom provided more than 50% of comments). This was significantly lower than the previous trial. The 8 people came from 2 distinct locations: Cockle Bay (3 people) and Onehunga (5 people, 2 of whom were located close to Yellow U23).
- on 205 occasions (12%) feedback was of a **generic** nature, analysis showed 8% related to Yellow U23 (17 comments provided by 11 people).

AIRWAYS BARNZ Auckland Airport

Yellow U23 Trial Results: Community feedback



The 11 people who provided generic Yellow U23 feedback each did so on less than five occasions.

They mainly came from Onehunga, Cockle Bay, Whitford and Flat Bush.

One of the 11 people was located in Mt Wgtn, several kilometres from Yellow U23.

Some Whitford residents presented to ANCCG in Sept 16 concerned about aircraft noise and Yellow U23 negatively impacting local wildlife and property values.

Concerns investigated and with assistance of expert advice concluded Yellow U23 does not significantly disturb local wildlife nor negatively impact property prices.

Draft Yellow U23 Trial Conclusion

Airways, BARNZ and Auckland Airport are satisfied that the trial proved:

- The flyability of the Yellow U23 SMART Approach flight path
- That the Yellow U23 SMART Approach flight path has the potential to provide benefits to airlines, in terms of reduced fuel burn and lower carbon dioxide emissions
- That the Yellow U23 SMART Approach flight path has the potential to provide benefits to Airways, in relation to enhanced airspace management.

The trial didn't demonstrate a current demand for 10 Yellow U23 SMART Approaches per day.

Marshall Day Acoustics (MDA) was able to extrapolate aircraft noise data gathered during the trial to assess the effects of 10 Yellow U23 SMART Approaches per day. They determined that the increase in noise levels would not be perceptible throughout the Auckland region, with the exception of Whitford where it would be just perceptible (4dB more).

A Person-Event Index study also assessed the impact of Yellow U23-related noise on the community Auckland wide. This study showed no change overall as the small increases in noise in the Whitford area were balanced out by decreases elsewhere.

Draft Yellow U23 Trial Conclusion

Because of the low level of aircraft noise measured at the noise monitors and the measured ambient noise levels (49 to 56 decibels Ldn), negative community concern is unlikely.

However, due to the low uptake of the Yellow U23 SMART Approach throughout the trial, there is a possibility that residents underneath the flight path could notice an increase from one approach per day to 10 approaches per day.

Therefore, it is recommended that a staged introduction of the Yellow U23 SMART Approach track be undertaken.

Future initiative

The December 2014 SMART Approach Flight Path Trial Final Report included a requirement that an investigation be undertaken to determine the feasibility of a second SMART Approach flight path from the south to Runway 23L.

That investigation has been completed and Airways, BARNZ and Auckland Airport believe that it should be trialled (Orange T23).

Yellow U23 Draft Decision

The following recommendations have been made to Auckland Airport by the trial partners:

1) The Yellow U23 SMART Approach flight path to Auckland Airport should be adopted for operational use in late 2017.

2) A maximum of six flights per day may use it.

3) Aircraft may only use it between the hours of 7am and 10pm.

4) The number of Yellow U23 SMART Approaches per day may be increased to a maximum of 10, provided that:

   a) Auckland Airport is satisfied that there is a consistent and ongoing demand for the additional Yellow U23 SMART Approaches

   b) Any increase in the maximum number above six per day is staged

   c) ANCCG has been consulted on the proposal to increase the maximum number above six per day.

5) A further SMART Approach flight path to Auckland Airport from the south to Runway 23L (Orange T23) be trialled from July 2018, provided that all trial methodology and assessment criteria have been confirmed including public notification prior to the trial and a public consultation process at its conclusion.

Yellow U23 Draft Report Public Consultation

Draft report released on Friday 20 October 2017.

Media release and advertisements in *Weekend Herald* and local community papers.
Website updated: www.aucklandflightpathtrial.co.nz
Stakeholders informed: (Local/Central Govt; ANCCG; business & aviation industry, Plane Truth)

Submissions will be accepted until 5pm on 15 November 2017 - can be made online at www.aucklandflightpathtrial.co.nz or posted:

Auckland Flight Path Trial
C/- Auckland Airport
PO Box 73020
Auckland Airport
Manukau 2150

Opportunities for members of the public who have made a written submission to present their submissions to the participants in the trial personally:

- Thursday 16 November 2017, Whitford Community Hall, 5pm-8pm
- Friday 17 November 2017, Nixon Park Community Hall, 10am-3pm

(15 minute time-slots allocated on a 'first come, first served' basis)

Airways, BARNZ and Auckland Airport will consider all feedback before publishing a final report in December 2017.