HAWKE'S BAY PBN CONSULTATION - NZGS

November 2022

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Phil Rakena

3 November 2022

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Hawke's Bay PBN - History

- PBN Implementation Project commenced in 2009 with NZQN
- Then rolled out to the international aerodromes (AA, WN, CH) over
- Regional aerodromes implementation started with HN, TG and RO in 2016
- The final regional aerodrome implementation was NS in 2018

WHAT ABOUT NAPIER AND GISBORNE?

- Originally scheduled alongside NS
- Delayed in 2018 due to resourcing (NS, NR and GS too much at once)
- Delayed in 2019 due to NR Tower staffing
- Delayed in 2020 due to the first COVID lockdown
- Delayed in 2021 due to the ongoing COVID impact on the aviation industry

Hawke's Bay PBN - ConOps

CONCEPT OF OPERATIONS

Nav Specification

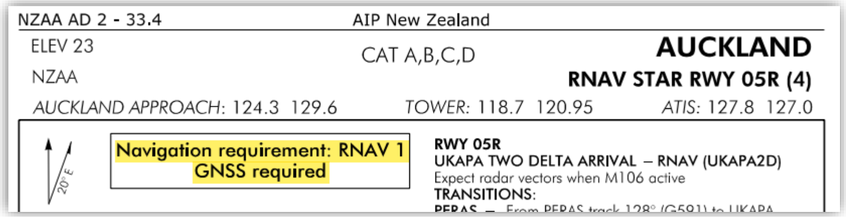
- Enroute RNAV2, with surveillance
- SIDs/STARs RNP1 Regional / RNAV1 International (due 24/7 ATC surveillance)

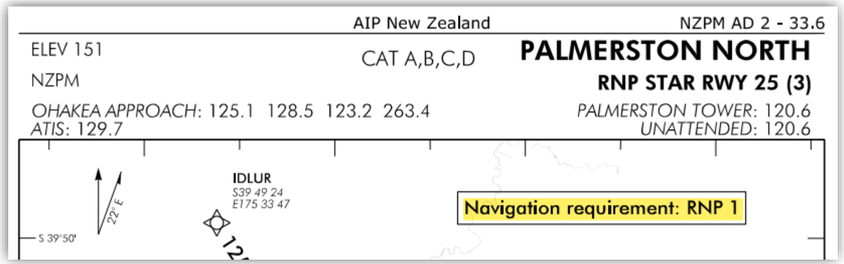
Routes – separated city-pairs and, where possible, SIDs/STARs

Limited NDB/VOR routing retained for non-certified/contingencies

Priority to PBN traffic

SIDs and STARs issued early – pilots can plan ahead and optimise profiles





10.3 Granting of Priorities

10.3.1 Priority will be given to the aircraft first able to use the airspace or manoeuvring area; **except**:

(a) where a more orderly flow or a significant economic benefit for a number of other aircraft would result by deferring this priority;

(b) where a significantly greater economic penalty to another aircraft would result e.g. by permitting a light aircraft to operate ahead of a large jet aircraft;

(c) aircraft operating in the normal pattern will be given priority over aircraft desiring to operate in conflicting patterns;

(d) where a training instrument approach has been approved, normal priority will be given to the aircraft from the time it commences final approach; and

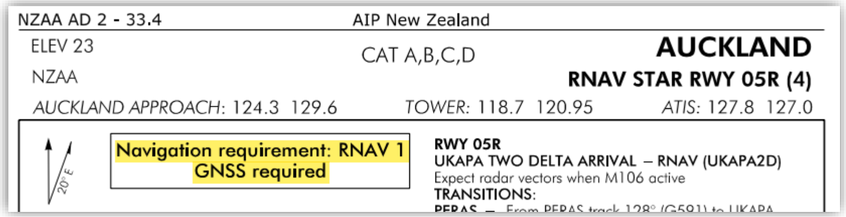
(e) where prior arrangement has been made for flight inspection checks and a priority has been predetermined.

(f) where PBN has been implemented, priority may be given to PBN operations over non-PBN operations.

Hawke's Bay PBN - ConOps

BENEFITS & DOWNSIDES

- Reduce delays, improve capacity and increase or maintain safety
- Separated inbounds/outbounds
- Consistent and predictable
- But:
  - Flexibility reduces, for less complex, simpler, safer IFPS
  - Mixed-mode RNP vs VOR-based IFPs adds complexity
  - Track miles *may* increase


NZAA AD 2 - 33.4 AIP New Zealand

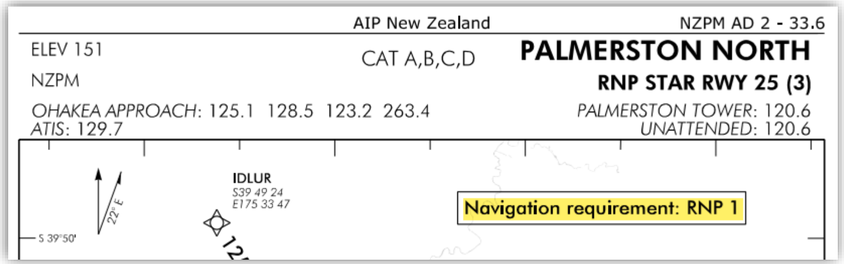
ELEV 23 CAT A,B,C,D **AUCKLAND**

NZAA **RNAV STAR RWY 05R (4)**

AUCKLAND APPROACH: 124.3 129.6 *TOWER*: 118.7 120.95 *ATIS*: 127.8 127.0

Navigation requirement: RNAV 1
GNSS required

RWY 05R
UKAPA TWO DELTA ARRIVAL – RNAV (UKAPA2D)
Expect radar vectors when M106 active
TRANSITIONS:


AIP New Zealand NZPM AD 2 - 33.6

ELEV 151 CAT A,B,C,D **PALMERSTON NORTH**

NZPM **RNP STAR RWY 25 (3)**

OHAKEA APPROACH: 125.1 128.5 123.2 263.4 *PALMERSTON TOWER*: 120.6
ATIS: 129.7 *UNATTENDED*: 120.6

IDLUR
S39 49 24
E175 33 47

Navigation requirement: RNP 1

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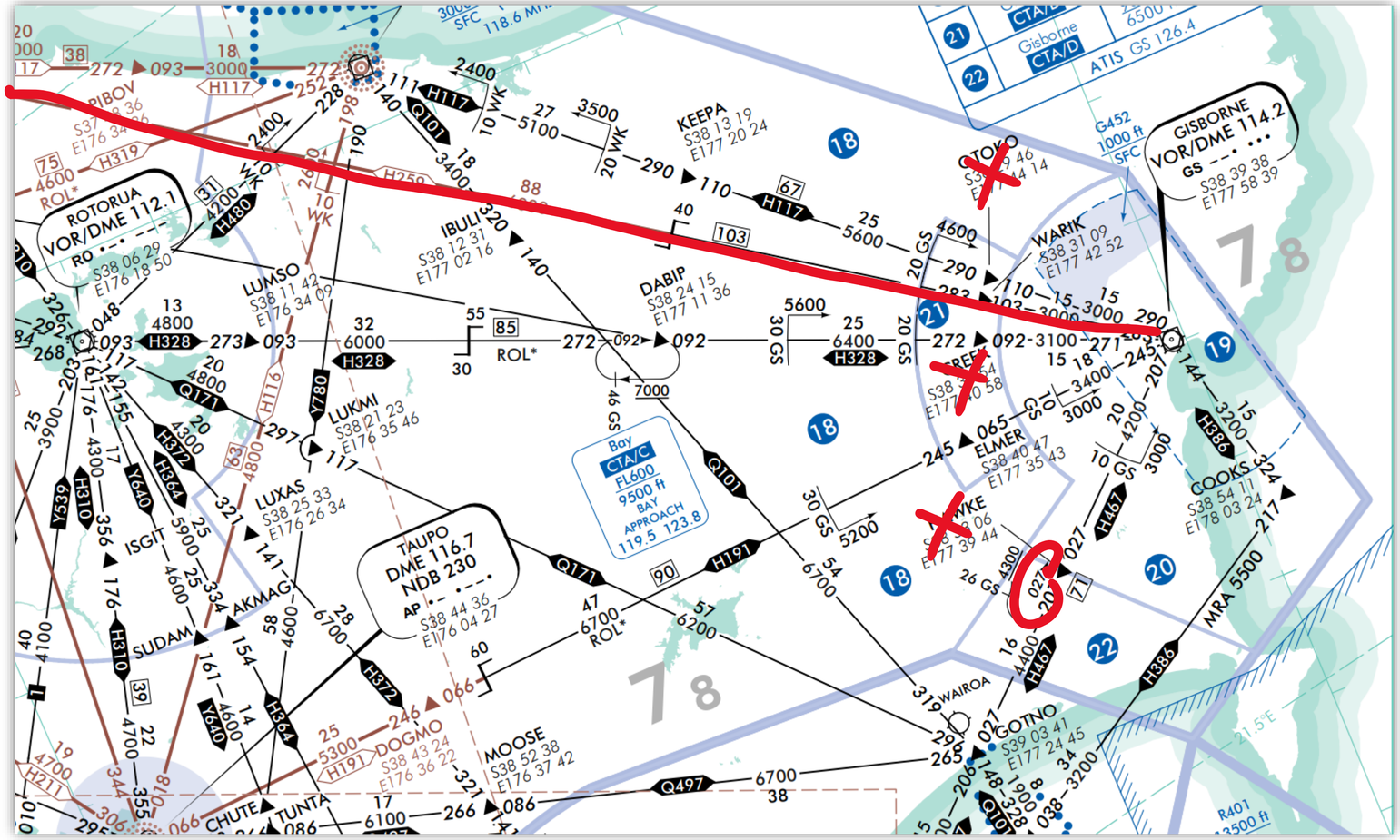
(f) where PBN has been implemented, priority may be given to PBN operations over non-PBN operations.

Hawke's Bay PBN – Gisborne Routes

ASSUMPTIONS
H259 TG NDB - GS VOR removed Remove HAWKE from H467 Remove HAWKE hold Remove OTOKO from H117 Remove CREEK from H328

- Direct TG – GS track unnecessary, via KEEPA or DABIP available
- HAWKE hold would require large amounts of airspace to contain
- OTOKO and CREEK replaced by DME distance steps



Hawke's Bay PBN – Gisborne RW32

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Hawke's Bay PBN – Gisborne RW14

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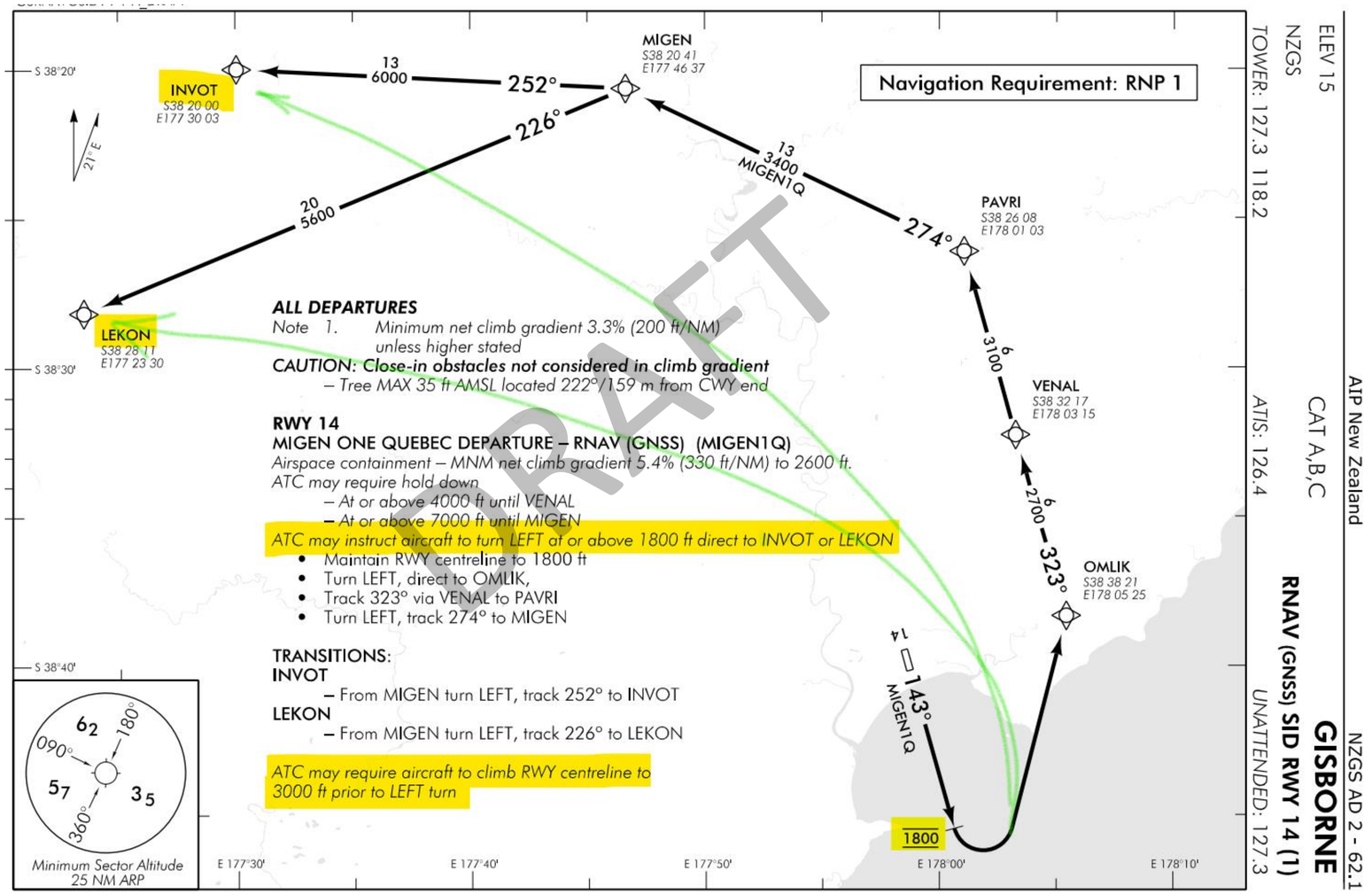
Hawke's Bay PBN – NZGS SID Direct tracking

- Where deemed advantageous, direct tracking will be built into SIDs
- Allows ATC to shorten track miles when a conflict is resolved e.g. once vertical separation is in place
- Direct tracking has been assessed for both airspace containment and obstacles
- Retains consistency and predictability



Hawke's Bay PBN – Gisborne IFPs amended

AIRWAYS

IFPs to be re-assessed:

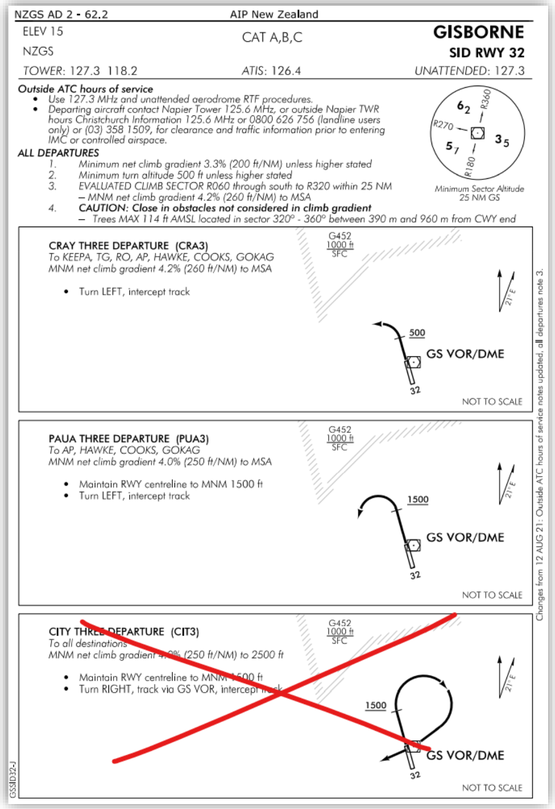
- VOR/DME missed approaches (for airspace containment)
- Conventional departures (for airspace containment)
- Evaluated Climb Sector (for airspace containment)

IFPs to be added:

- VASNI hold – as arrival, to join either arc from the east

IFPs to be deleted:

- RW14 GANET ONE
- RW32 CITY THREE



NZGS AD 2 - 62.2 AIP New Zealand

ELEV 15 | CAT A,B,C | **GISBORNE**
NZGS | **SID RWY 32**
TOWER: 127.3 118.2 | ATIS: 126.4 | UNATTENDED: 127.3

Outside ATC hours of service
- *Use 127.3 MHz and unattended aerodrome RTF procedures.*
- *Departing aircraft contact Napier Tower 125.6 MHz, or outside Napier TWR hours Christchurch Information 125.6 MHz or 0800 626 756 (landline users only) or (03) 358 1509, for clearance and traffic information prior to entering IMC or controlled airspace.*

ALL DEPARTURES
1. *Minimum net climb gradient 3.3% (200 ft/NM) unless higher stated*
2. *Minimum turn altitude 500 ft unless higher stated*
3. *EVALUATED CLIMB SECTOR R060 through south to R320 within 25 NM – MNM net climb gradient 4.2% (260 ft/NM) to MSA*
4. ***CAUTION: Close in obstacles not considered in climb gradient** – Trees MAX 114 ft AMSL located in sector 320° - 360° between 390 m and 960 m from CWY end*

R060, R270, R180 | 6 2, 3 5, 5 7 | Minimum Sector Altitude 25 NM GS

CRAY THREE DEPARTURE (CRA3)
To KEEPA, TG, RO, AP, HAWKE, COOKS, GOKAG
MNM net climb gradient 4.2% (260 ft/NM) to MSA
- Turn LEFT, intercept track

G452 1000 ft SFC | 500 | GS VOR/DME | 32 | 21°E | NOT TO SCALE

PAUA THREE DEPARTURE (PUA3)
To AP, HAWKE, COOKS, GOKAG
MNM net climb gradient 4.0% (250 ft/NM) to MSA
- Maintain RWY centreline to MNM 1500 ft
- Turn LEFT, intercept track

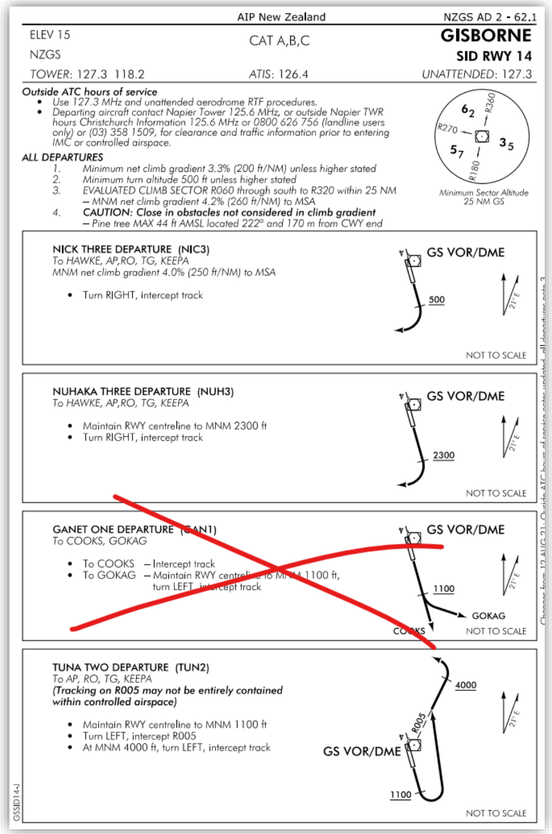
G452 1000 ft SFC | 1500 | GS VOR/DME | 32 | 21°E | NOT TO SCALE

CITY THREE DEPARTURE (CIT3)
To all destinations
MNM net climb gradient 4.0% (250 ft/NM) to 2500 ft
- Maintain RWY centreline to MNM 1500 ft
- Turn RIGHT, track via GS VOR, intercept R___

G452 1000 ft SFC | 1500 | GS VOR/DME | 32 | 21°E | NOT TO SCALE

GS5D/D2-J

Changes from 12 AUG 21: Outside ATC hours of service notes updated, all departures note 3.



AIP New Zealand NZGS AD 2 - 62.1

ELEV 15 | CAT A,B,C | **GISBORNE**
NZGS | **SID RWY 14**
TOWER: 127.3 118.2 | ATIS: 126.4 | UNATTENDED: 127.3

Outside ATC hours of service
- *Use 127.3 MHz and unattended aerodrome RTF procedures.*
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ALL DEPARTURES
1. *Minimum net climb gradient 3.3% (200 ft/NM) unless higher stated*
2. *Minimum turn altitude 500 ft unless higher stated*
3. *EVALUATED CLIMB SECTOR R060 through south to R320 within 25 NM – MNM net climb gradient 4.2% (260 ft/NM) to MSA*
4. ***CAUTION: Close in obstacles not considered in climb gradient** – Pine tree MAX 44 ft AMSL located 222° and 170 m from CWY end*

R060, R270, R180 | 6 2, 3 5, 5 7 | Minimum Sector Altitude 25 NM GS

NICK THREE DEPARTURE (NIC3)
To HAWKE, AP,RO, TG, KEEPA
MNM net climb gradient 4.0% (250 ft/NM) to MSA
- Turn RIGHT, intercept track

GS VOR/DME | 500 | 21°E | NOT TO SCALE

NUHAKA THREE DEPARTURE (NUH3)
To HAWKE, AP,RO, TG, KEEPA
- Maintain RWY centreline to MNM 2300 ft
- Turn RIGHT, intercept track

GS VOR/DME | 2300 | 21°E | NOT TO SCALE

GANET ONE DEPARTURE (GAN1)
To COOKS, GOKAG
- To COOKS – Intercept track
- To GOKAG – Maintain RWY centreline to MNM 1100 ft, turn LEFT, intercept track

GS VOR/DME | 1100 | GOKAG | COOKS | 21°E | NOT TO SCALE

TUNA TWO DEPARTURE (TUN2)
To AP, RO, TG, KEEPA
(Tracking on R005 may not be entirely contained within controlled airspace)
- Maintain RWY centreline to MNM 1100 ft
- Turn LEFT, intercept R005
- At MNM 4000 ft, turn LEFT, intercept track

GS VOR/DME | R005 | 4000 | 1100 | 21°E | NOT TO SCALE

GS5D/D14-J

Changes from 12 AUG 21: Outside ATC hours of service notes updated, all departures note 3.

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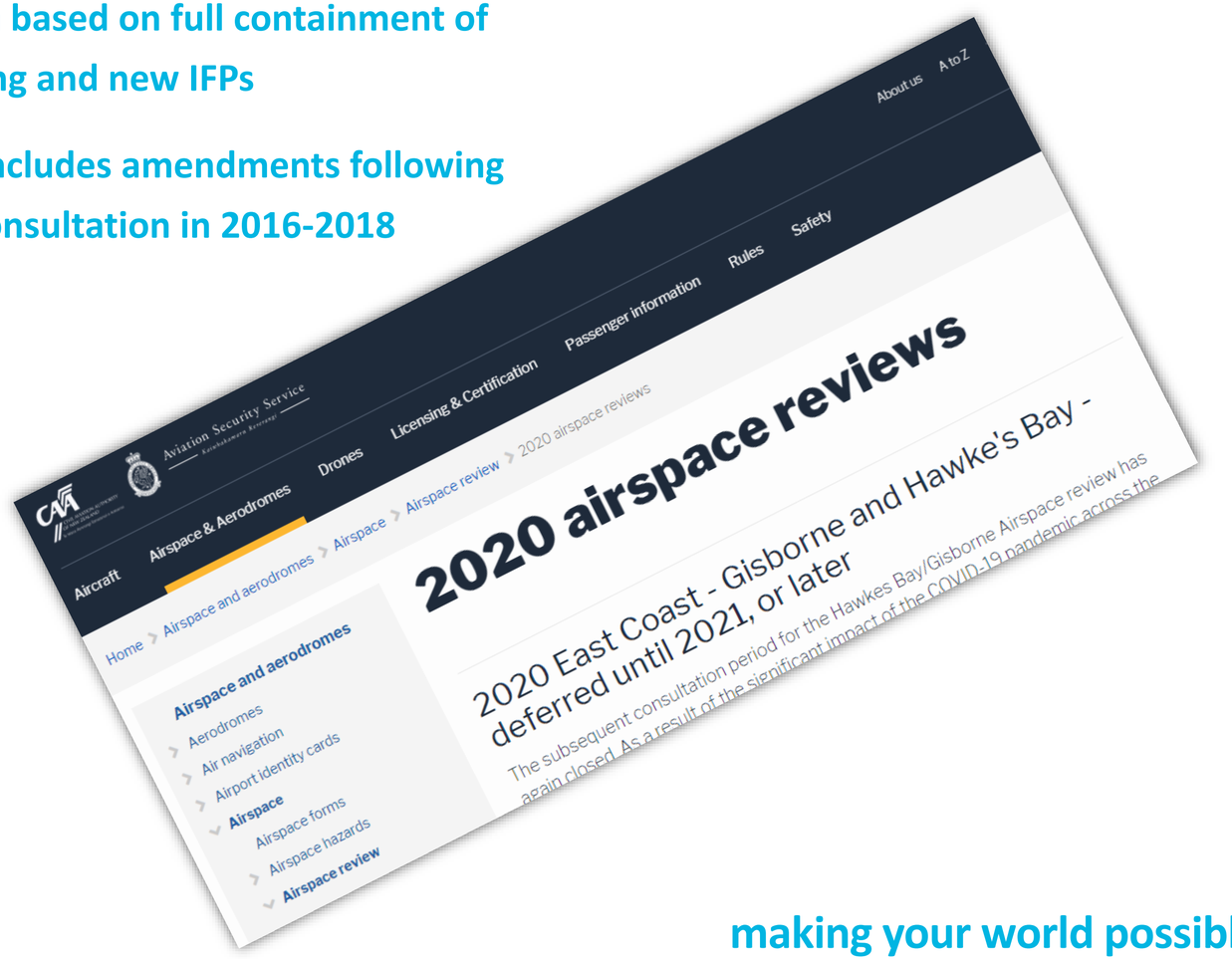
Hawke's Bay PBN – Gisborne Airspace

- **Airways will make a submission to CAA following the consultation meetings**
- **Submission based on full containment of both existing and new IFPs**
- **Version 4 includes amendments following previous consultation in 2016-2018**



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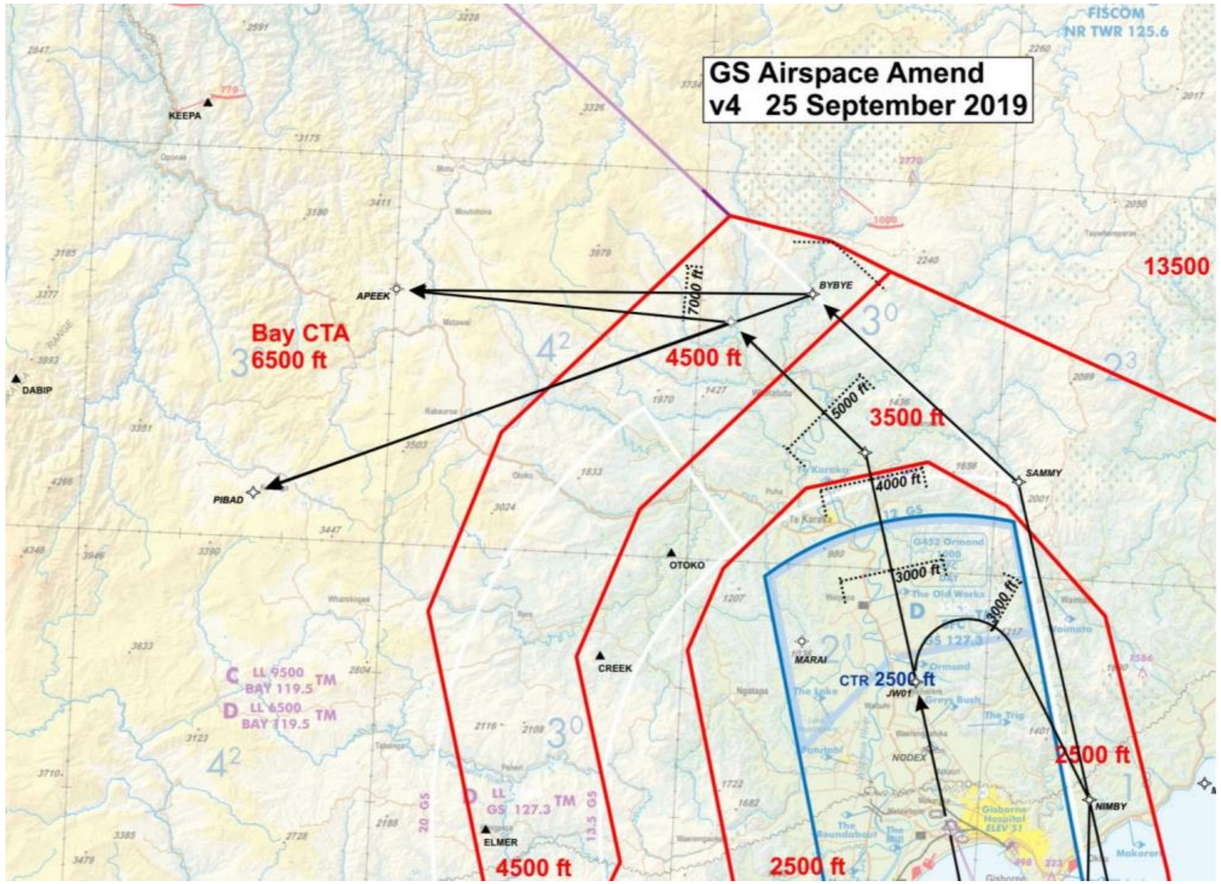

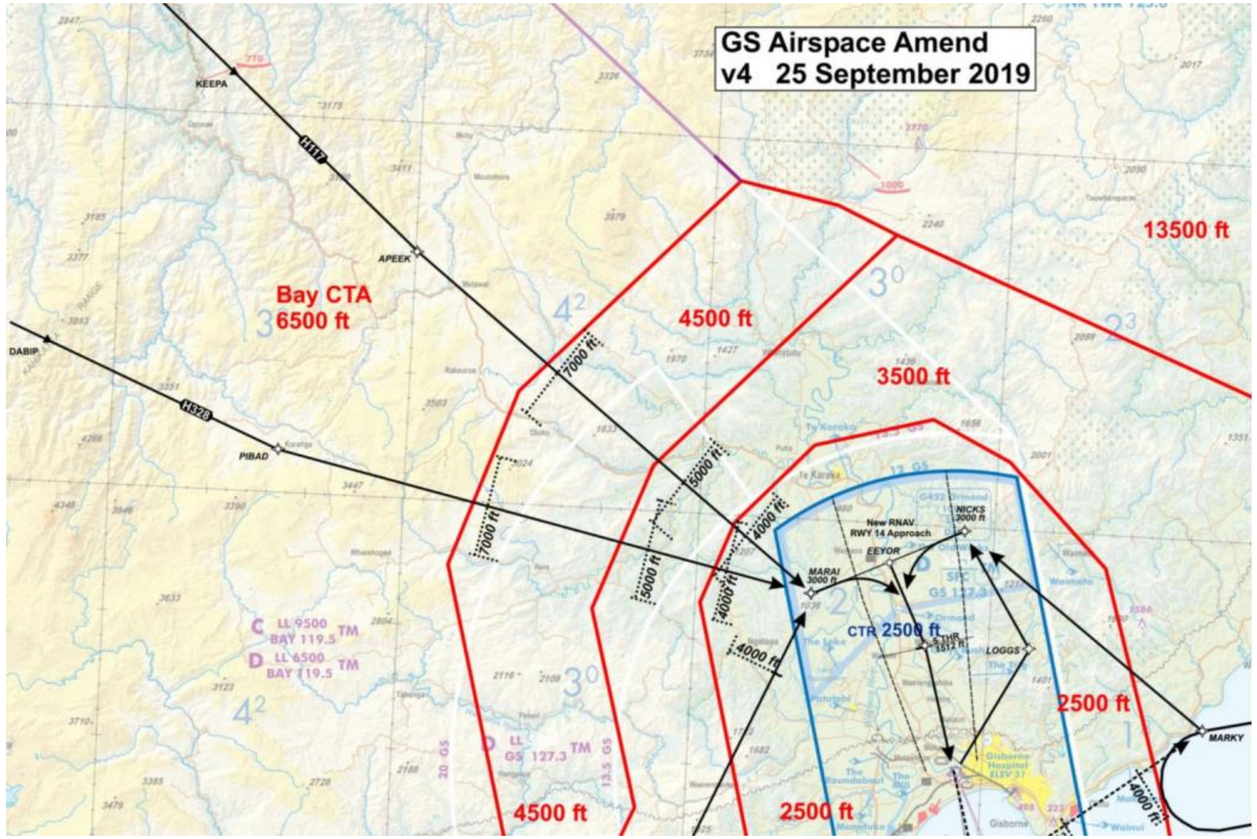

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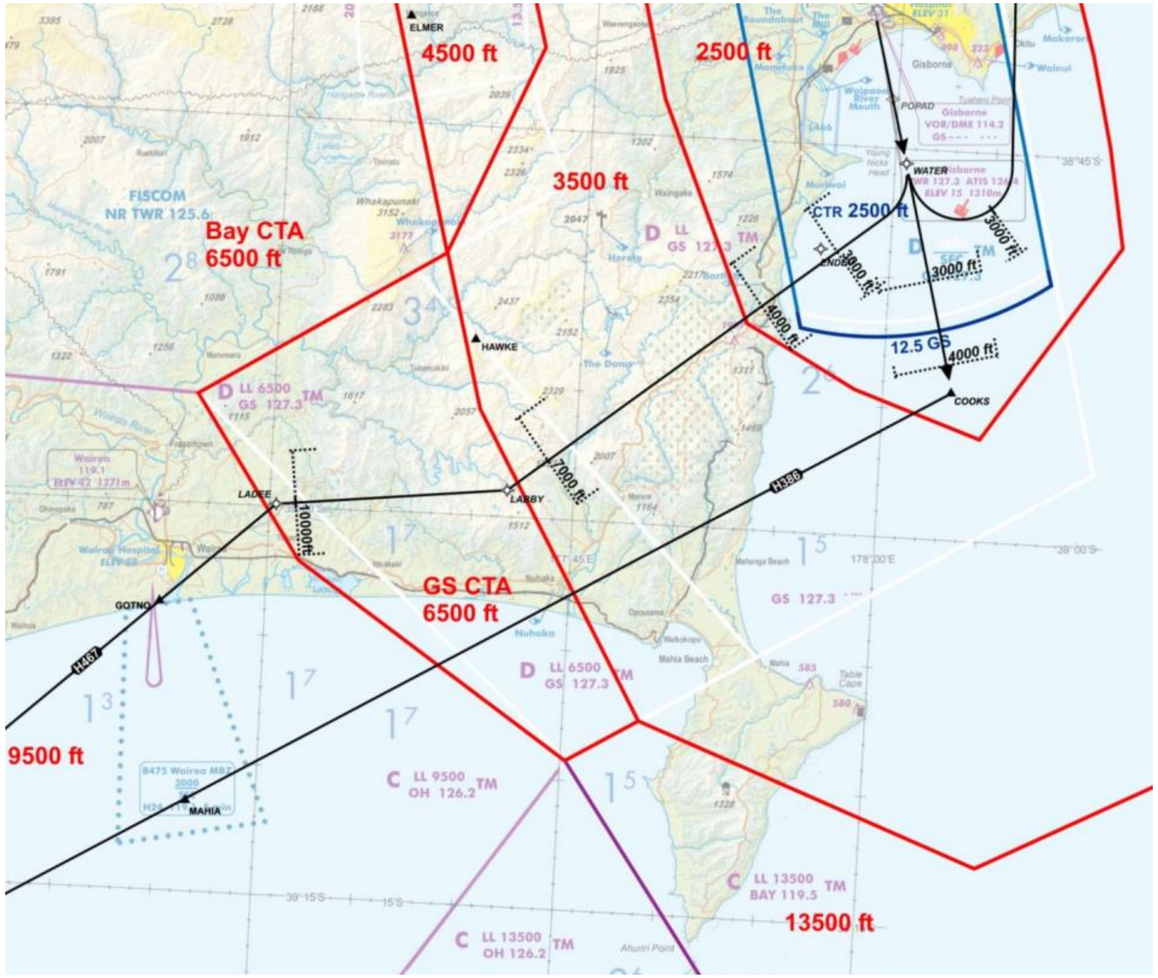

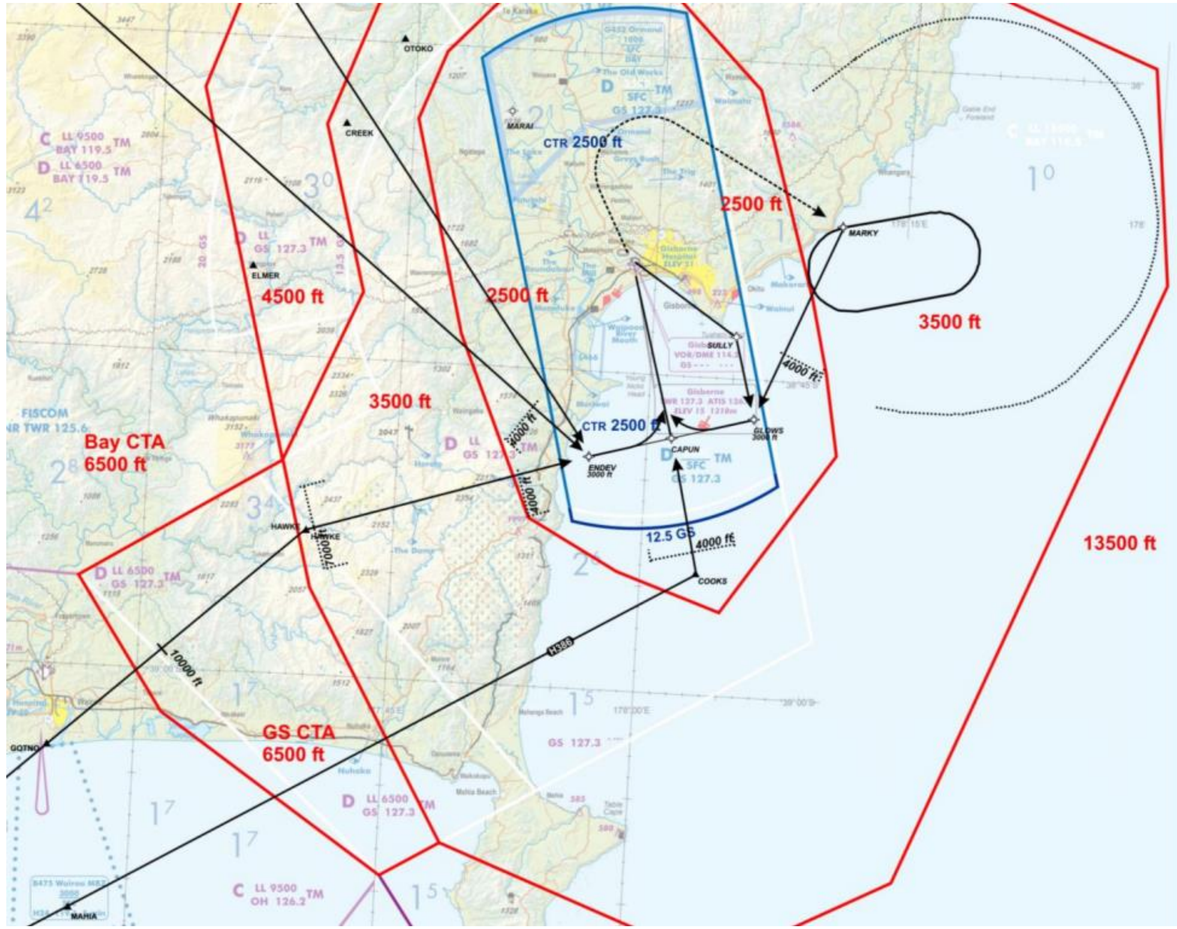

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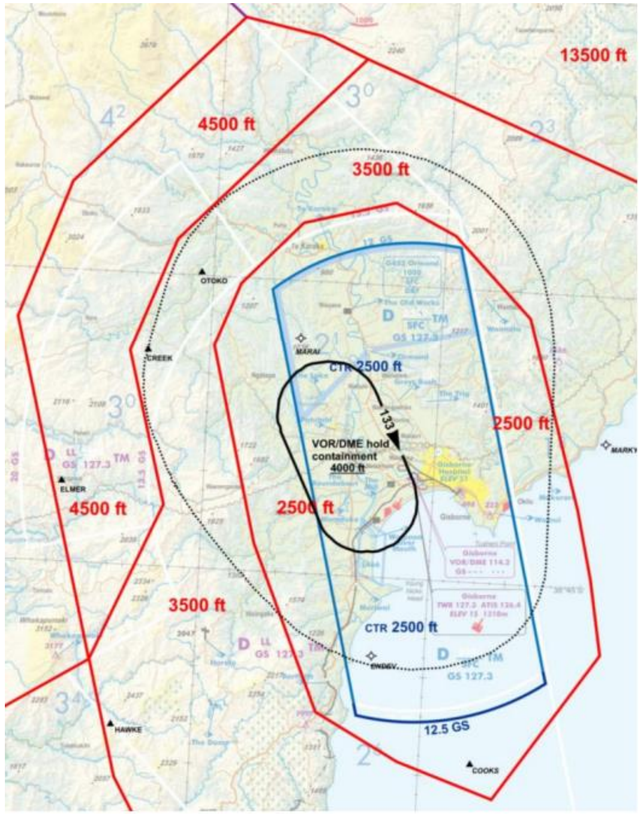
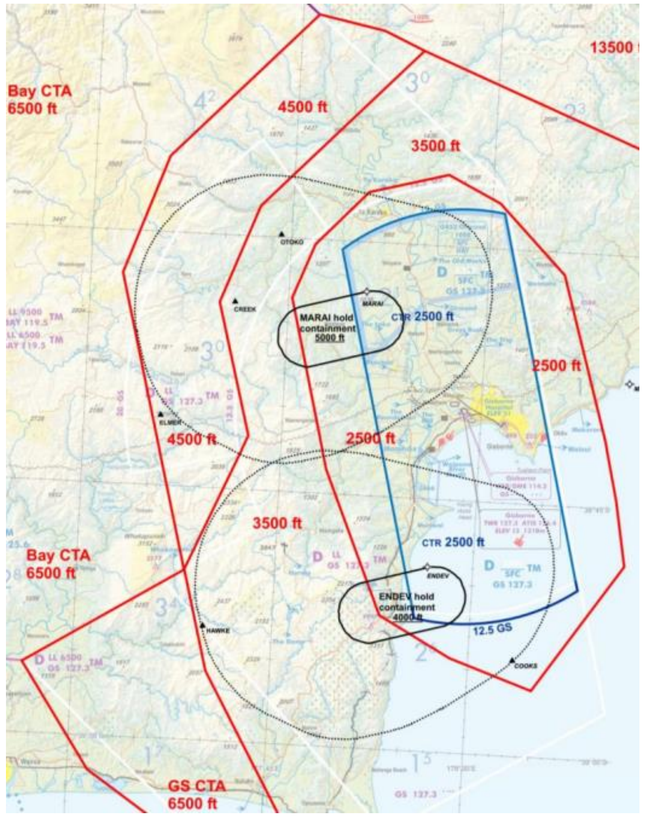
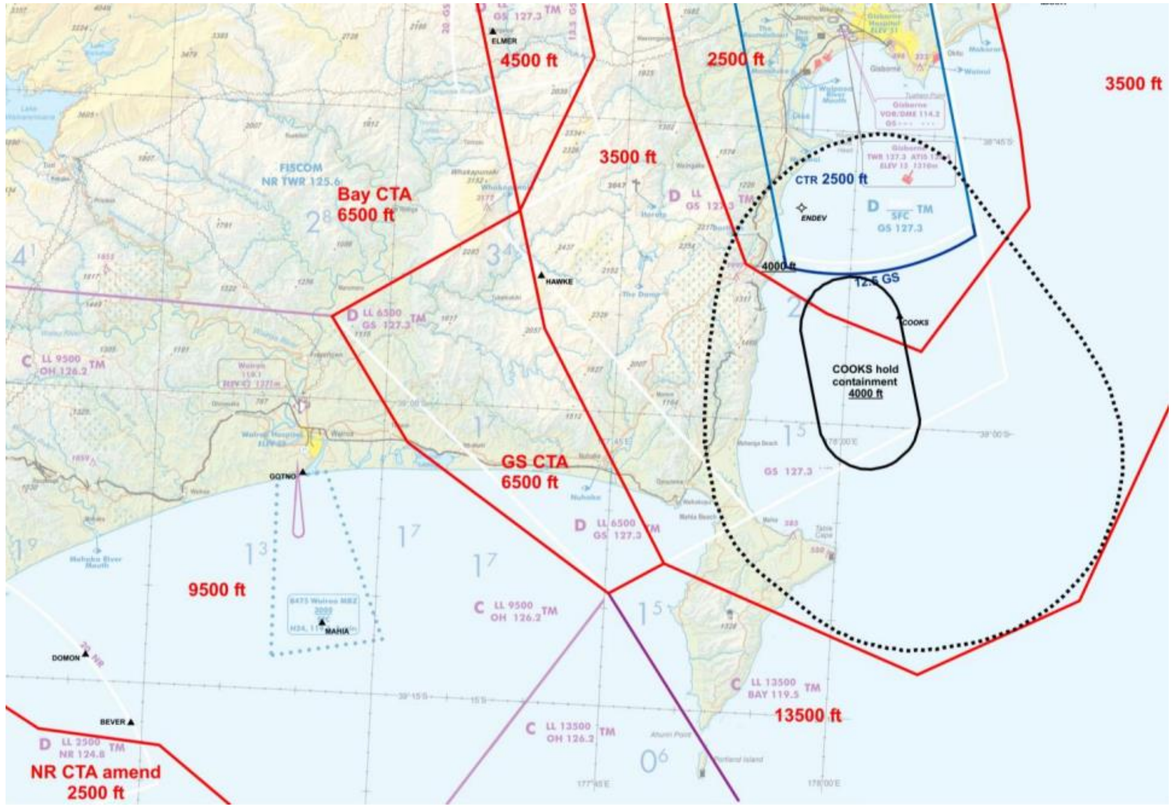
Hawke's Bay PBN – Gisborne Airspace







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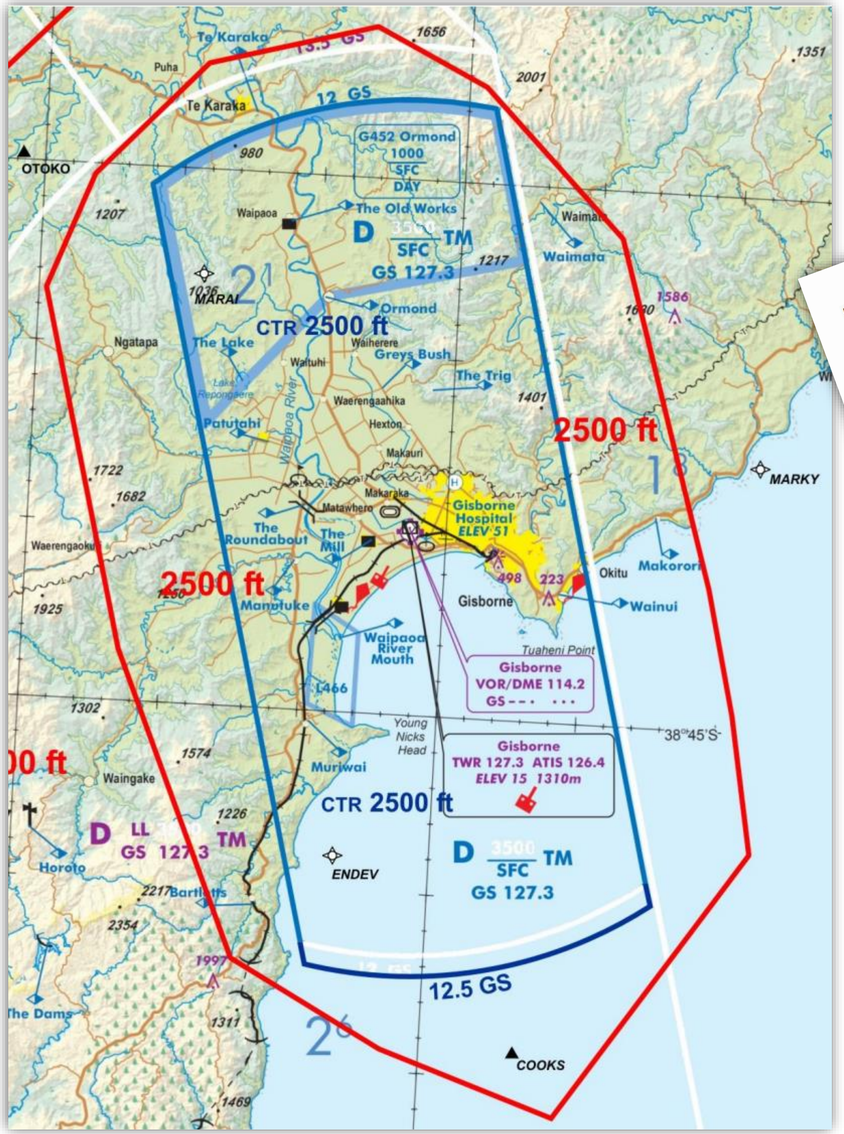
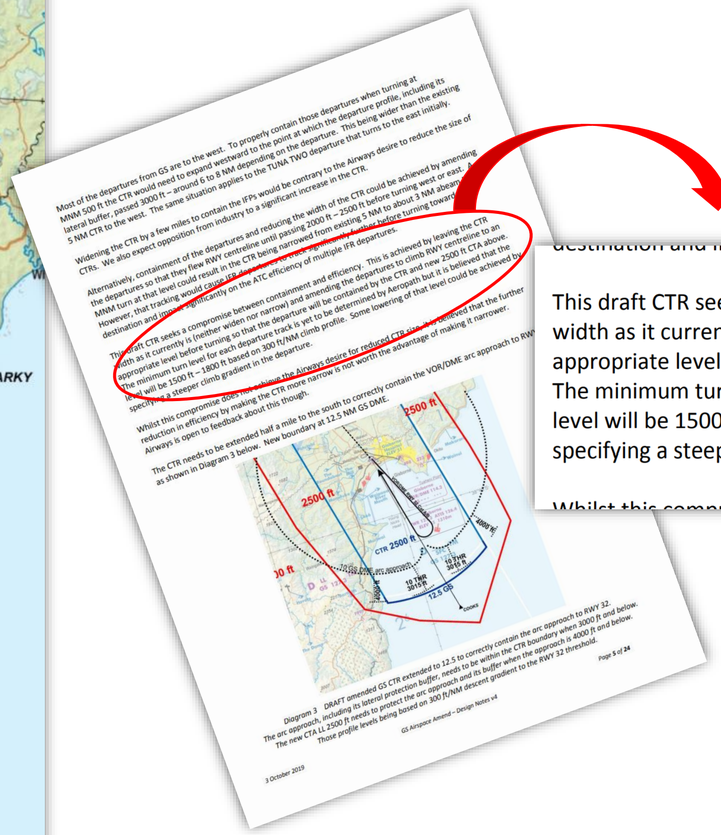
Hawke's Bay PBN – Gisborne Airspace





Most of the departures from GS are to the west. To properly contain those departures when turning at MNM 500 ft the CTR would need to expand westward to the point at which the departure profile, including its lateral buffer, passed 3000 ft – around 6 to 8 NM depending on the departure. This being wider than the existing 5 NM CTR to the west. The same situation applies to the TUNA TWO departure that turns to the east initially.

Widening the CTR by a few miles to contain the IFPs would be contrary to the Airways desire to reduce the size of CTRs. We also expect opposition from industry to a significant increase in the CTR.

Alternatively, containment of the departures and reducing the width of the CTR could be achieved by amending the departures so that they flew RWY centreline until passing 2000 ft – 2500 ft before turning west or east. However, that tracking would cause IFR departures to [illegible] before turning towards their destination and impact significantly on the ATC efficiency of multiple IFR departures.

This draft CTR seeks a compromise between containment and efficiency. This is achieved by leaving the CTR width as it currently is (neither widen nor narrow) and amending the departures to climb RWY centreline to an appropriate level before turning so that the departure will be contained by the CTR and new 2500 ft CTA above. The minimum turn level for each departure track is yet to be determined by Aeropath but it is believed that the level will be 1500 ft – 1800 ft based on 300 ft/NM climb profile. Some lowering of that level could be achieved by specifying a steeper climb gradient in the departure.

Whilst this compromise does not achieve the Airways desire for reduced CTR size, it is believed that the further reduction in efficiency by making the CTR more narrow is not worth the advantage of making it narrower. Airways is open to feedback about this though.

The CTR needs to be extended half a mile to the south to correctly contain the VOR/DME arc approach to RWY as shown in Diagram 3 below. New boundary at 12.5 NM GS DME.

Diagram 3 DRAFT amended GS CTR extended to 12.5 to correctly contain the arc approach to RWY 32.
The arc approach, including its lateral protection buffer, needs to be within the CTR boundary when 3000 ft and below.
The new CTA LL 2500 ft needs to protect the arc approach and its buffer when the approach is 4000 ft and below.
Those profile levels being based on 300 ft/NM descent gradient to the RWY 32 threshold.

3 October 2019

GS Airspace Amend – Design Notes v4

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destination and impact significantly on the ATC efficiency of multiple IFR departures.

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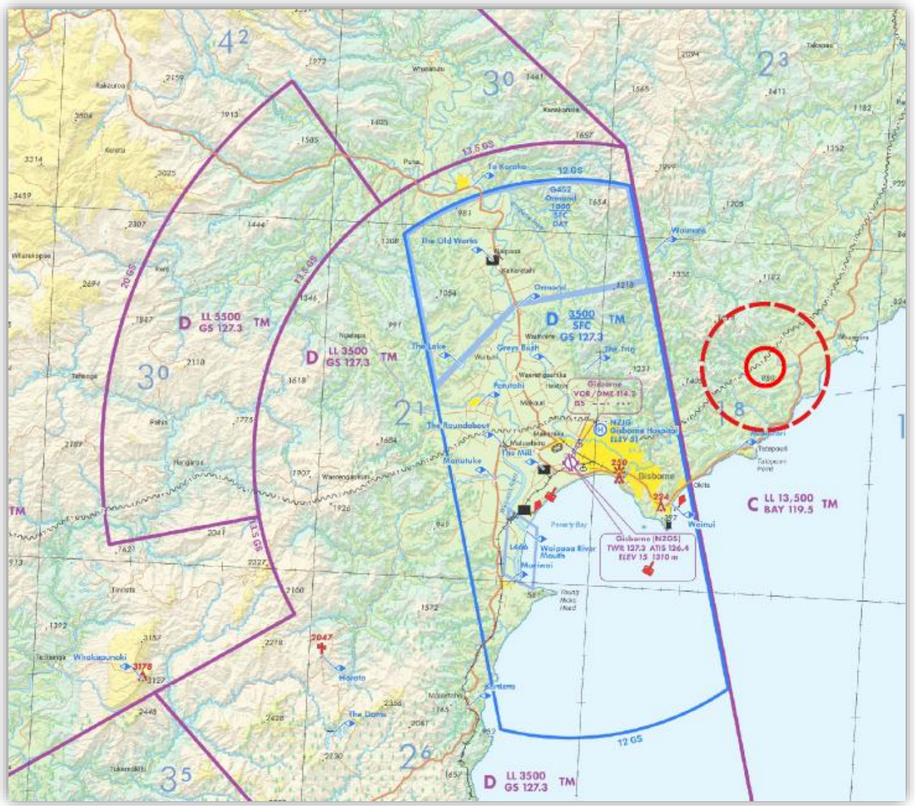
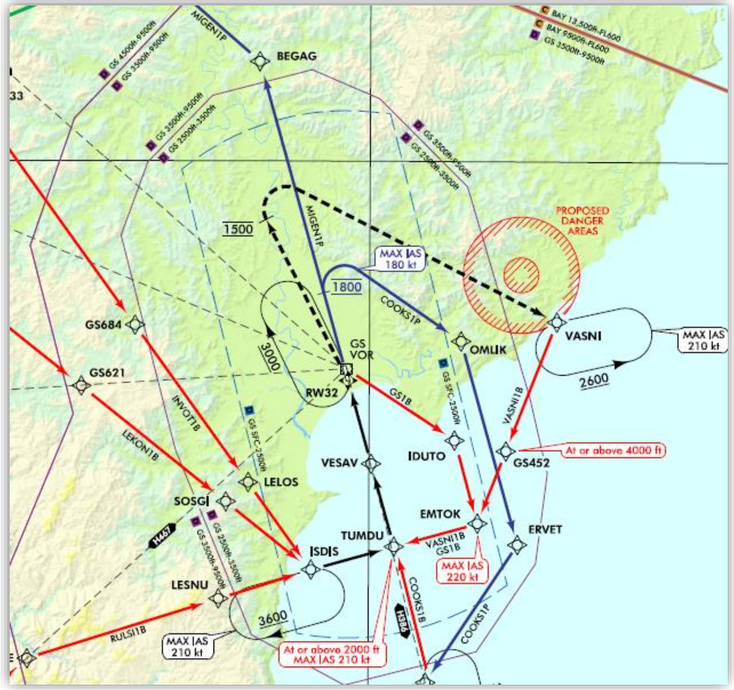
Whilst this compromise does not achieve the Airways desire for reduced CTR size, it is believed that the further

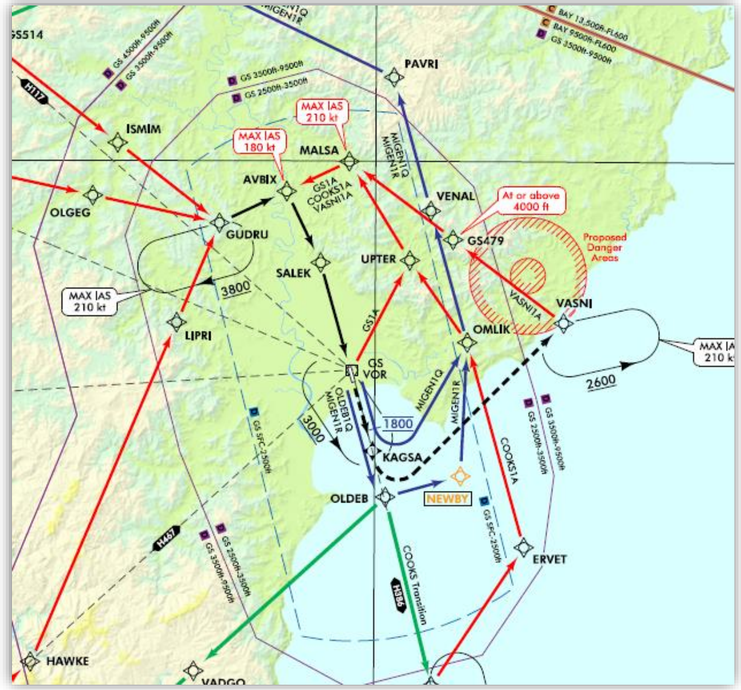
Hawke's Bay PBN – Vortex Power Systems



- Current VPS proposal only affects airspace above A135 (Bay Approach)
- Gisborne Tower unaffected

- Following PBN implementation and airspace review (if accepted), VPS proposal would conflict with new IFPs, in particular the missed approaches for the new RNP approaches.
- Gisborne Tower impacted and will need to manage the airspace.





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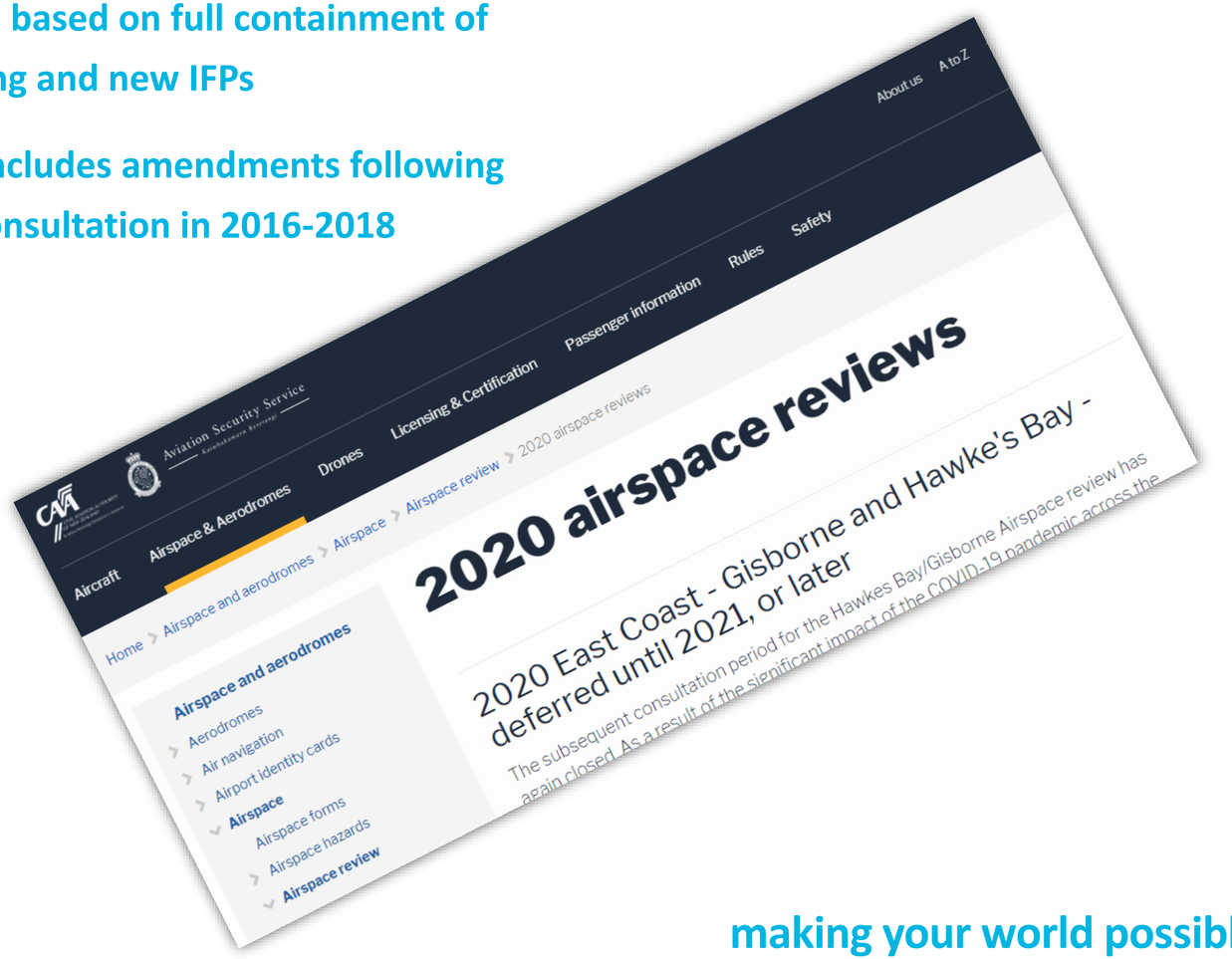
Hawke's Bay PBN – Napier Airspace

NR Airspace Amend v5 25 November 2018

- Airways will make a submission to CAA following the consultation meetings
- Submission based on full containment of both existing and new IFPs
- Version 5 includes amendments following previous consultation in 2016-2018



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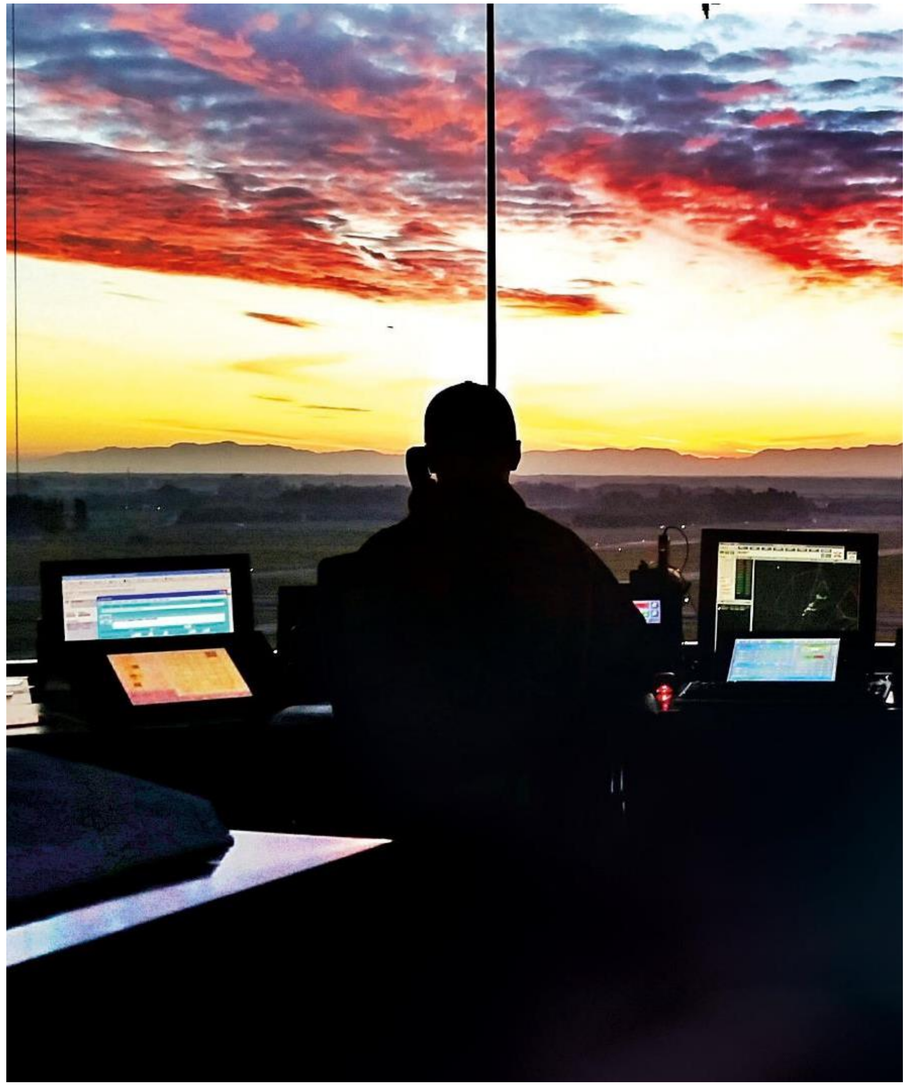
Hawke's Bay PBN – Timeline

PBN TIMELINE 2022/23

- **Dec 22 (latest)** **Airways Airspace Submission made to CAA**
- **Feb – Apr 23** **CAA Airspace Consultation**
- **11 May 23** **VNC Chart Cutoff** (final date for any CAA airspace decision)
- **24 Jul 23** **ENRC Cutoff** (final date for any route changes)
- **31 Aug 23** **AIRAC Publishing Cutoff** (final date for any changes to AIP pages)
- **30 Nov 23** **Implementation date**