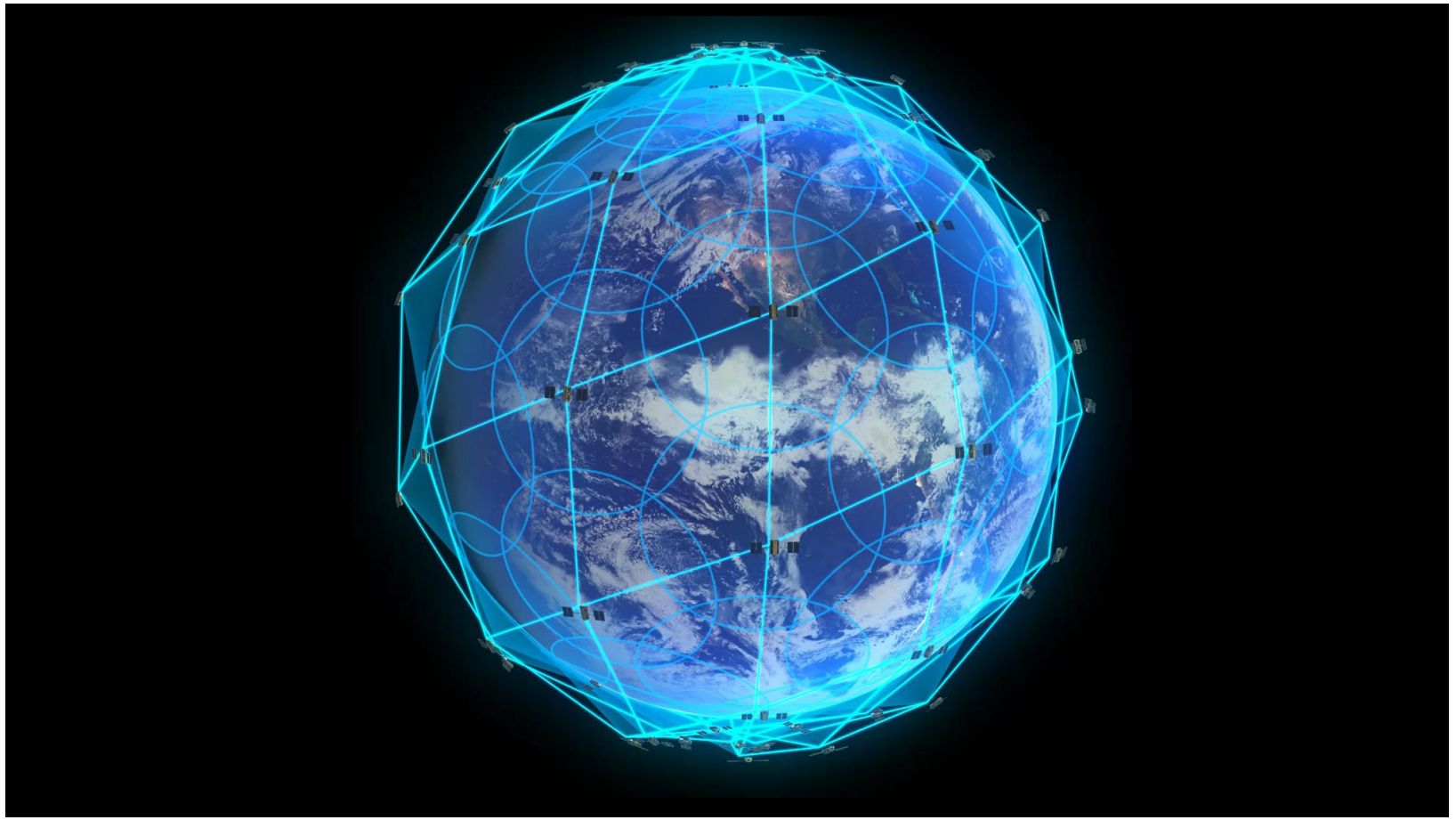
BVLOS

Iridium Global Network



100% global coverage
same service, same performance, truly global, two-way

LEO Advantage
topology and architecture advantageous for mobile applications

Low cost device & antennas, low power transceivers,
small form factor

66 Cross-Linked Space Vehicles

LEO = Low Earth Orbit

L-Band is Aviation protected spectrum for Safety Services

Everyday Pilots Fly IFR in Hard IMC (Zero Visibility) Safely

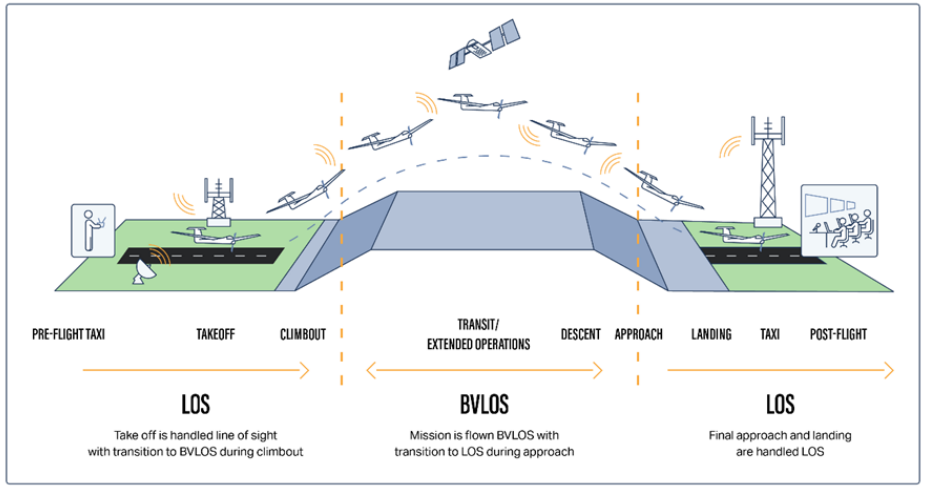
IFR Training

Hard IMC

BVLOS

Hard IMC and BVLOS require Pilots to Fly using Instruments.

IFR vs BVLOS



Perform IFR or Oceanic:

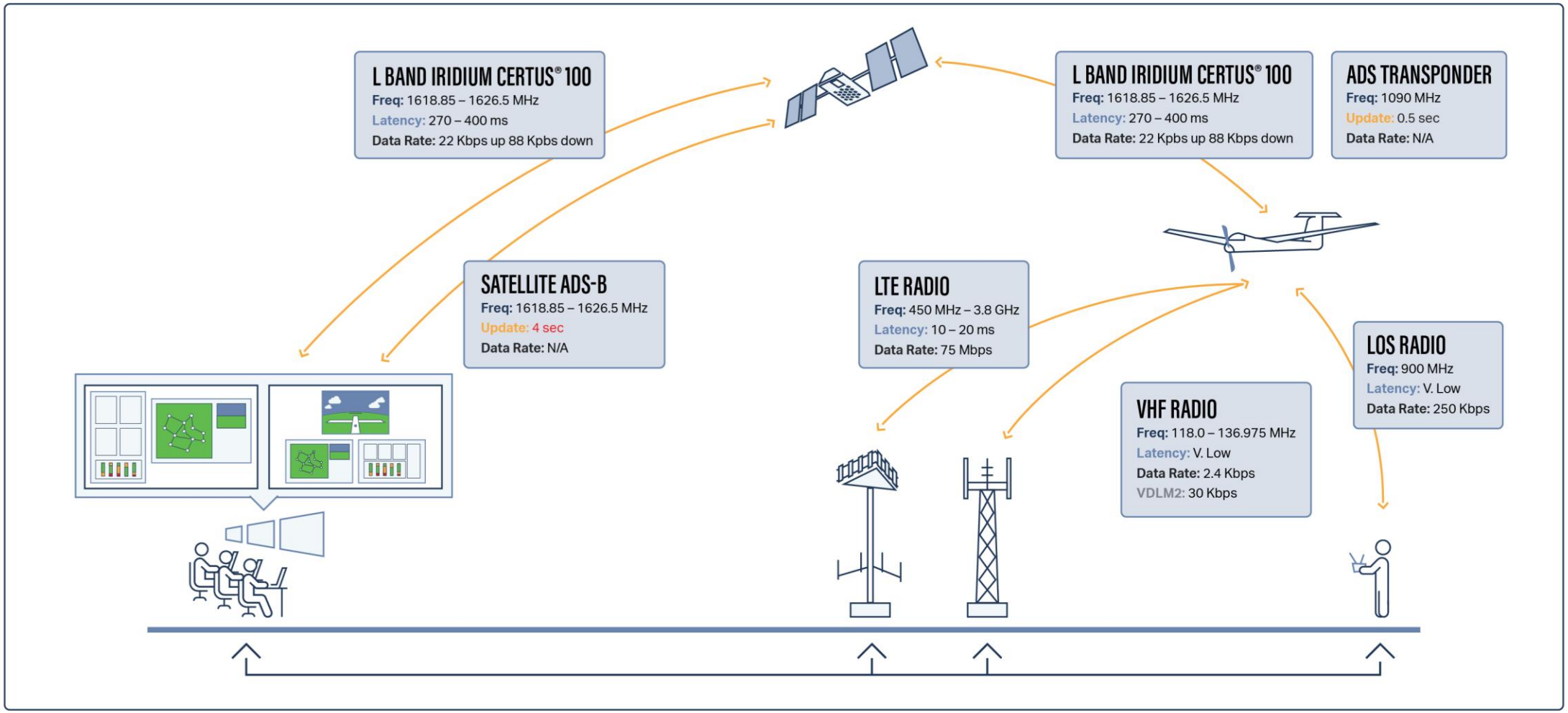
- MEL
- Current Pilot IFR Rating
- Approved Flight Plan
- Go Fly
- **Happens over 100,000 times per day!!**

Perform BVLOS:

- Hey what about the MEL?????
- BVLOS Pilot Rating ?????
- Approved Flight Plan
- BVLOS Waiver Granted????
- Go Fly ???????
- **RARELY Happens….**

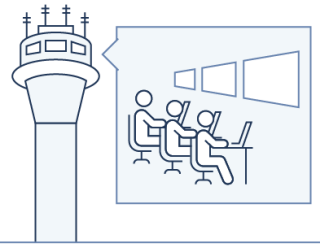
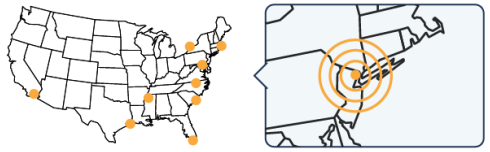
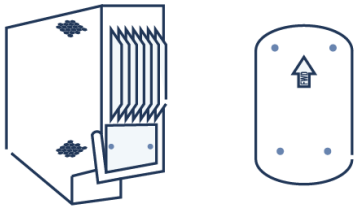
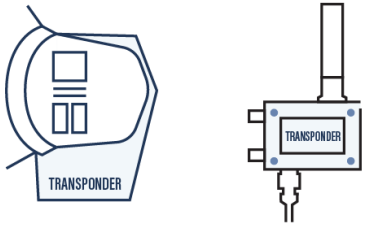
Aviation is able to provide safe consistent operations because of a Minimum Equipment List
Industry is able to provide solutions when there is an MEL

Commercial Off-The-Shelf (COTS) can maintain safe separation today!



Many technologies are available today that can ensure tracking and C2 Globally

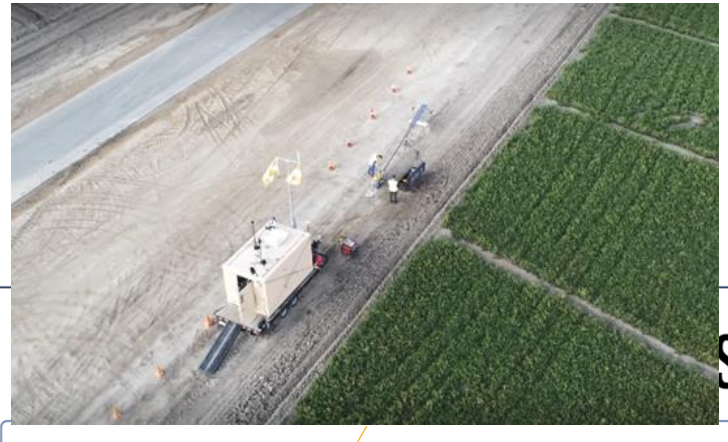
ANSP Tools Used Today in the NAS

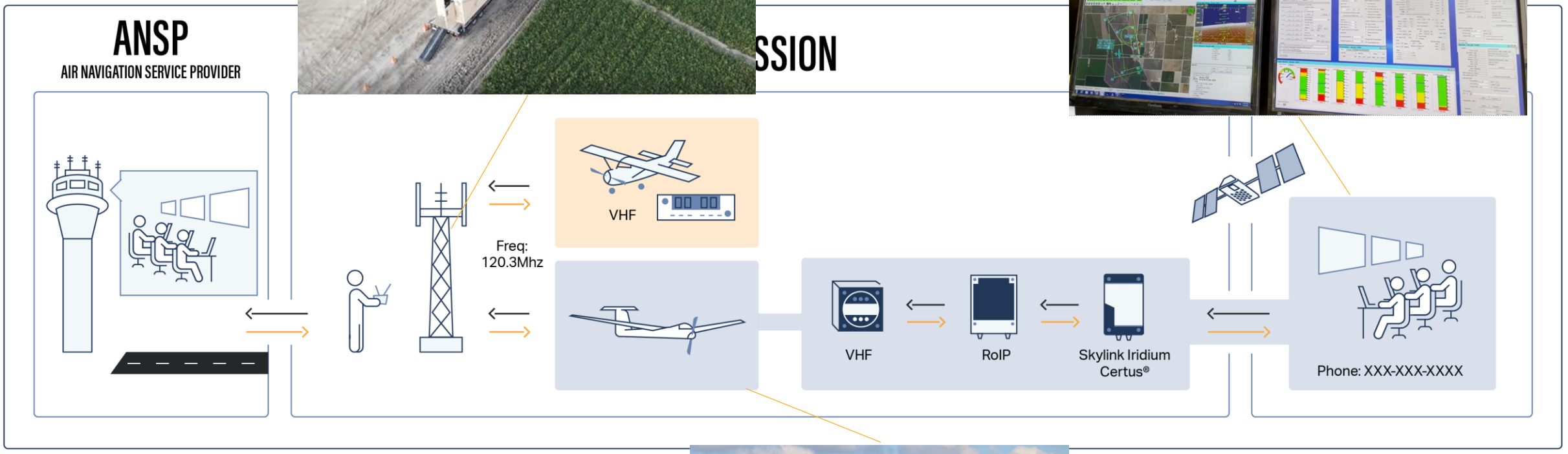
ASR	TCAS	SATELLITE ADS-B OUT	SATELLITE ADS-B IN
AIRPORT SURVEILLANCE RADAR	TRAFFIC COLLISION AVOIDANCE SYSTEM	AUTOMATIC DEPENDENT SURVEILLANCE BROADCAST	AUTOMATIC DEPENDENT SURVEILLANCE BROADCAST
Update Rate: 4 sec	Update Rate: 1 sec	Update Rate: 4 sec	Update Rate: 4 sec
			
			

IFR Technology For BVLOS

TECHNOLOGY	PRODUCT	PURPOSE	
Iridium Satellite L-band	Iridium Connected® Blue Sky Network SkyLink 7100	Tracking and command and control	
LTE Air to Ground	Iridium Connected® Blue Sky Network SkyLink 7100	Tail camera video	
VHF	AirPlus KRT2	Listen to ATC	
RoIP	SyTech Radius	Convey the VHF traffic over satellite for RPIC	
Transponder	SAGEM Mode S	Situational awareness of the drone with all other traffic	
Satellite Surveillance	Aireon	Situational awareness of the drone with all other traffic all altitudes	
Traffic Awareness	PASSUR ARiVA	Browser-based software tool that provides situational awareness of traffic with 4-second update rate	
900 MHz Radio		LOS command and control	
Control	Piccolo	Command and control	

Mission

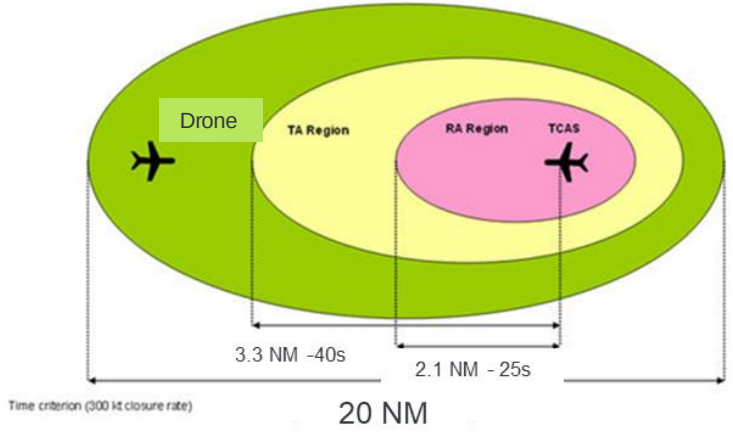


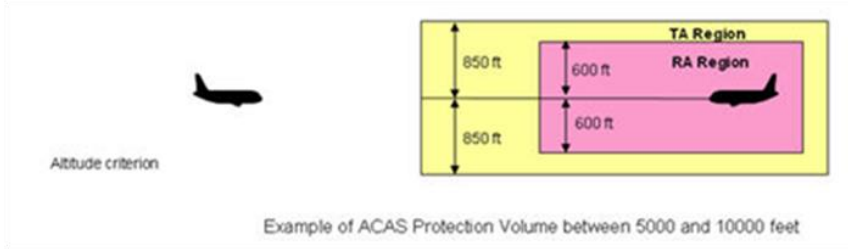

ANSP
AIR NAVIGATION SERVICE PROVIDER
SSION
VHF
Freq:
120.3Mhz
VHF
RoIP
Skylink Iridium
Certus®
Phone: XXX-XXX-XXXX

Separation – Time, Distance and Speed

ACAS II

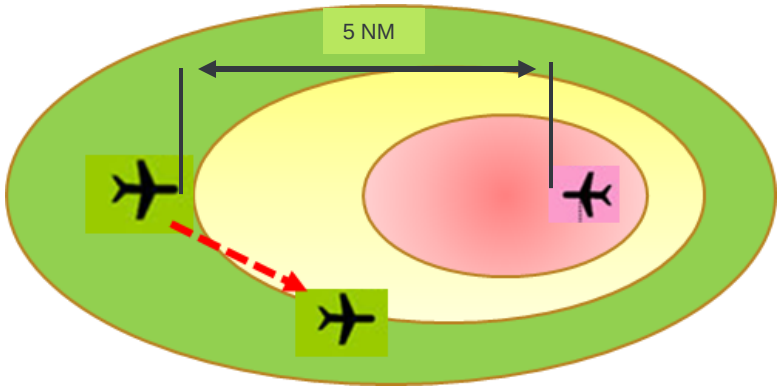
- Mandated before ADS-B
- Safety Standard for Controlled Airspace
- Forces Safe Separation
- Software works on 1.2NM every 15 sec





Remote Monitored Drone – Evasive Maneuver

- Maintains separation under same criterion without ACAS II
- Using COTs Technology



		Target (sec)	Actual (sec) 2:39 pm	Actual (sec) 2:42 pm	Actual (sec) 2:44 pm
T0	Identify Issue	0	0	0	0
T1	Ring Aircraft	4	2.05	3.35	2.82
T2	Develop a response	4	3.40	2.48	1.61
T3	Issue Flight Command	4	2.22	1.28	2.38
T5	Acknowledge Command	4	7.11	6.31	5.69
T4	Aircraft responds and clear	4	6.32	3.98	5.29
	Total Time	20	21.1	17.4	17.79

Starting point for BVLOS waiver

WAIVER FOR BEYOND VISUAL LINE OF SIGHT OPERATIONS

Date: | Takeoff Location: | RPIC:

AIRCRAFT TYPE

☐ Fixed Wing ☐ Rotor Wing ☐ Other

(Explain)

MISSION TYPE

☐ Surveillance ☐ Delivery ☐ Inspection

☐ Other (Explain)

DESCRIPTION OF MISSION ROUTE

☐ Rural ☐ Suburban
☐ Remote ☐ Infrastructure
☐ Urban

(Explain)

BEYOND VISUAL LINE OF SIGHT MINIMUM EQUIPMENT LIST (MEL)

Surveillance ADS-B (Out):

☐ 1090 Mhz Transponder ☐ Other Transponder

(Equipment Detail)

Surveillance Operations Feed ADS-B (In):

☐ Ground ☐ Satellite ☐ Other

(Explain)

Communication (Must have a minimum of 2 available through all phases of flight):

☐ 4G/LTE/5G ☐ L-band ☐ 900 MHz ☐ C Band ☐ VHF ☐ Other

Equipment Type and Part Number

Equipment Type and Part Number

Equipment Type and Part Number

Equipment Type and Part Number

Equipment Type and Part Number

Equipment Type and Part Number

VHF ROIP Description

Communication Prioritization (Must have a minimum of 2 available through all phases of flight):

Primary Equipment/Coverage

Alternate Equipment/Coverage

Contingent Equipment/Coverage

Emergency Equipment/Coverage

WAIVER GRANTED | WAIVER DENIED

TUSKER
SKOOP AERO
SKOOP AERO

iridium®
connected

FLYLOGIX
FX2.4
FLYLOGIX
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FNAL

MINISTRY OF FISHERIES
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KANUK
ewool

YETICON

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