Strengthening Remote Warfare Capabilities by Boosting Resiliency in the RPA Program

University of Virginia | Hacking 4 Defense

Caroline Still, Kaylee Moore, Strother Cech, Thien-Kim Dinh

The RPA program is crucial to the modern warfighting capabilities of the US Air Force, but high burnout rates make this program **unsustainable**
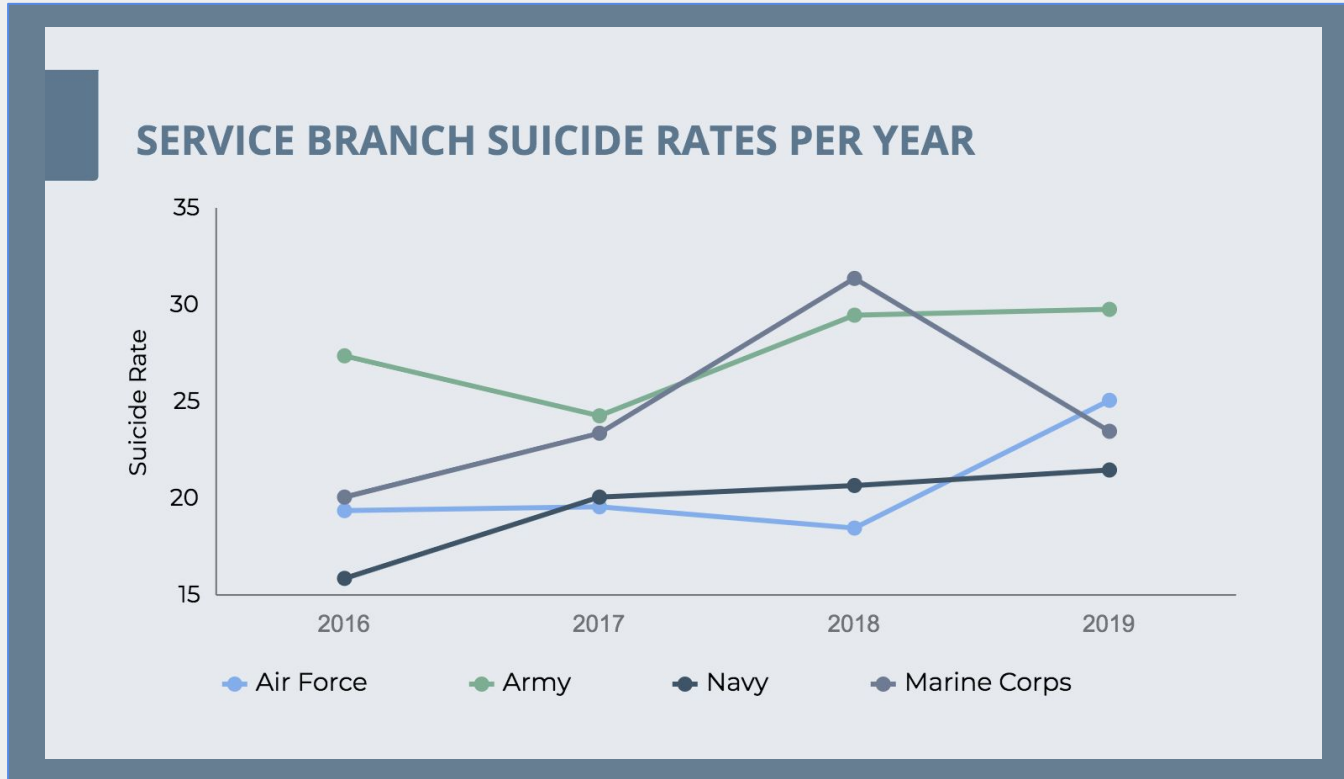
76%
increase in demand for RPA pilots

RPA pilot retention is less than **10%**

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Air Force active duty **suicides are trending up** compared to other service branches

SERVICE BRANCH SUICIDE RATES PER YEAR

Air Force ● Army ● Navy ● Marine Corps

Remote warriors have **higher suicide ideation** rates than other Air Force personnel

REMOTE WARRIORS

6-11%
surveyed reported experiencing suicidal thoughts **in the past week**

VS

GENERAL AIR FORCE

4%
surveyed reported experiencing suicidal thoughts **in the past year**

Source: Goodman et al., A Reassessment of Risk Factors and Frequency of Suicide Ideastion Among US Air Force Remote Warrsions (2018)

Source: Snarr et al., Recent Suicide Ideation and Suicide Attempts in a Large-Scale Survey of the U.S. Air Force (2010)

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"Seven out of the ten airmen I've had here are trying or are going to get out or have expressed extreme depression or talked of suicide."

— RPA Commander, 2018 RAND Study

RPA retention rates are **significantly lower** than other types of Air Force pilots

RPA retention is less than **10 percent** while take-rates for other pilots are consistently about **44 percent**
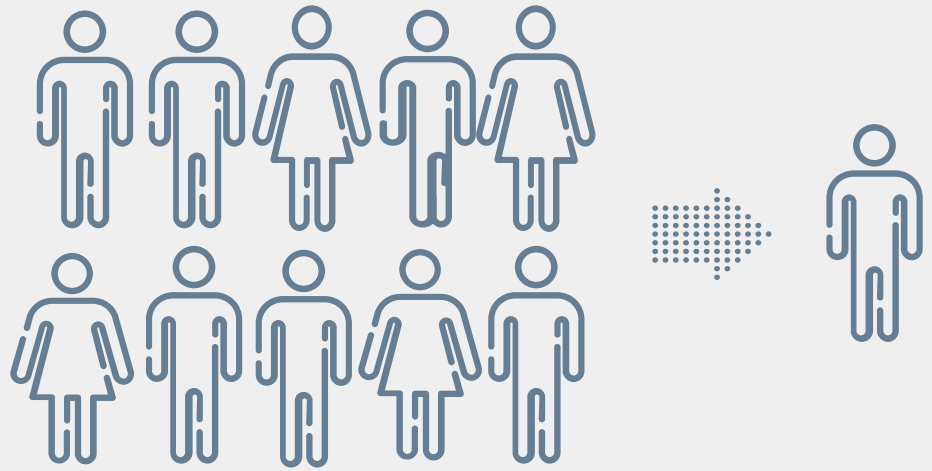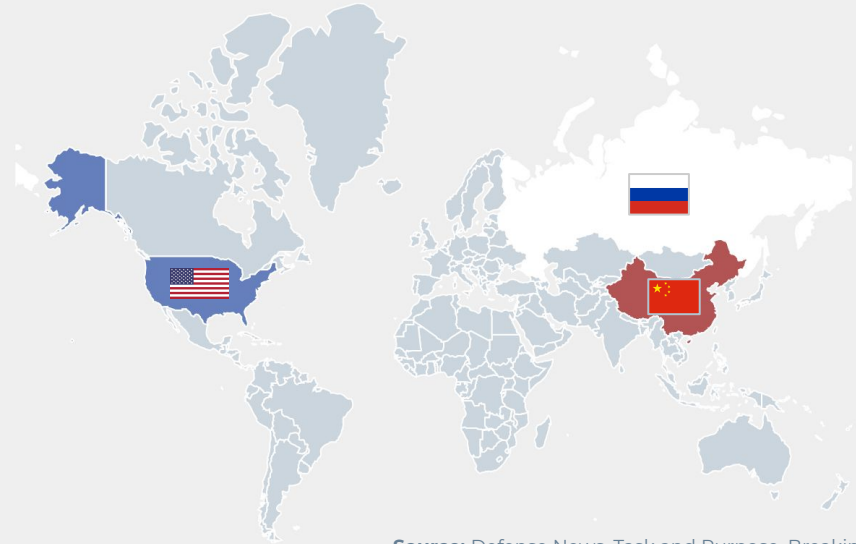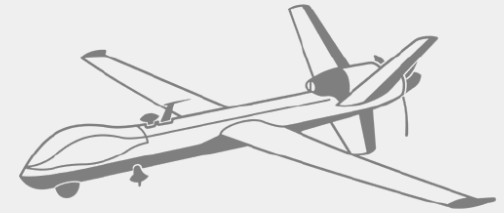
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RPAs are vital to **defeating** current threats and **deterring** future aggression

- Center for Strategic and Budgetary Assessments recommends that the Air Force **increase** drone forces from **25** to **43** squadrons

- Commanders of CENTCOM and AFRICOM describe the MQ-9 Reaper force as crucial in **combating** both **violent extremist groups** and regional rival **Iran**

- **Russia** and **China** are developing **rapid aggression capabilities** against neighboring states under the cover of increasingly capable reconnaissance-strike networks

Source: Defense News, Task and Purpose, Breaking Defense

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AGENDA

1. EXECUTIVE SUMMARY

2. CONTEXT

3. IMPLEMENTATION OBSTACLES

4. OUR RECOMMENDATIONS

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EXECUTIVE SUMMARY

Executive Summary

Problem:
1. The burnout rates of RPA pilots are unsustainably high
2. Air Force leadership recognizes the problem but fails to implement known solutions

Recommendations:
1. Invest in RPA-specific recruitment & promotion pathways
2. Increase behavioral health support
3. Improve RPA logistics and scheduling

2

CONTEXT

ISSUES RECOGNIZED, BUT PROBLEM CONTINUES

THE 2014 GAO REPORT

The GAO report found that the Air Force **fails** to **prioritize RPA human capital efforts** in order to achieve program goals

Ineffective recruitment

Low education & promotion rates

Operating below optimum crew ratio

INEFFICIENT MANAGEMENT
&
POOR QUALITY OF LIFE

Limited access to support services

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THE 2020 GAO REPORT

The GAO report found that the Air Force still faced the **same challenges** as 2014 with **minimal attempted improvement**

REACTIVE MEASURES

APPEASEMENT OVER RESULTS

UNFINISHED IMPLEMENTATION

3
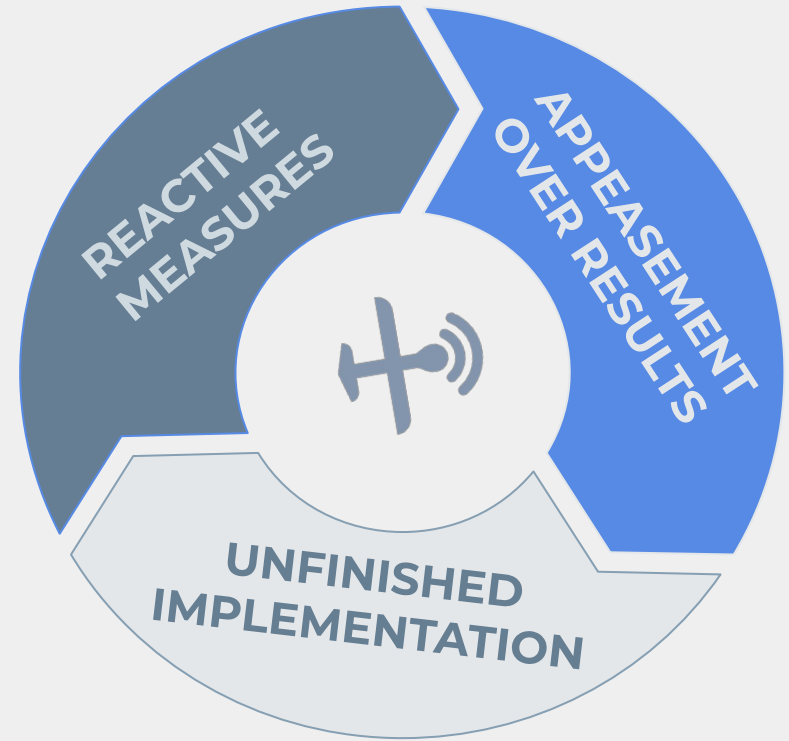
IMPLEMENTATION OBSTACLES

COST

CULTURE

COMPLACENCY

Obstacle 1: The Air Force is deterred by **high short-term costs** of reforming the RPA program

Operation

The annual operating cost for an MQ-9 Reaper is about **four times** that of an F-16 or A-10.

Retention incentives

Air Force relies on special and incentive pays (S&I) for improving retention rates. Congress appropriated $1.2 billion for these in FY19.

Revamped recruitment

An RPA-specific recruitment pipeline would require diverting resources and funds to this new program.

Facility upgrades

According to a recent RAND study, RPA bases were generally seen as "undesirable". USAF appropriated $85 million for a new RPA center at Holloman AFB that never happened.

Reform is an investment, but returns will outweigh short-term costs.

RPAs are only going to become more important to the Air Force mission moving forward. Retaining RPA pilots and their specialized skill set is more cost-effective than constantly retraining new pilots.

RPA program draws from **many parts** of the Air Force budget

RPA program draws from these areas of the budget

Any funding for new policy initiatives would probably impact these areas as well

$168 Billion
Total USAF Budget

Procurement
15.0%

Operation & Maintenance
32.8%

RDT&E
21.2%

MILPERS
21.6%

Source: USAF FY2021 Budget
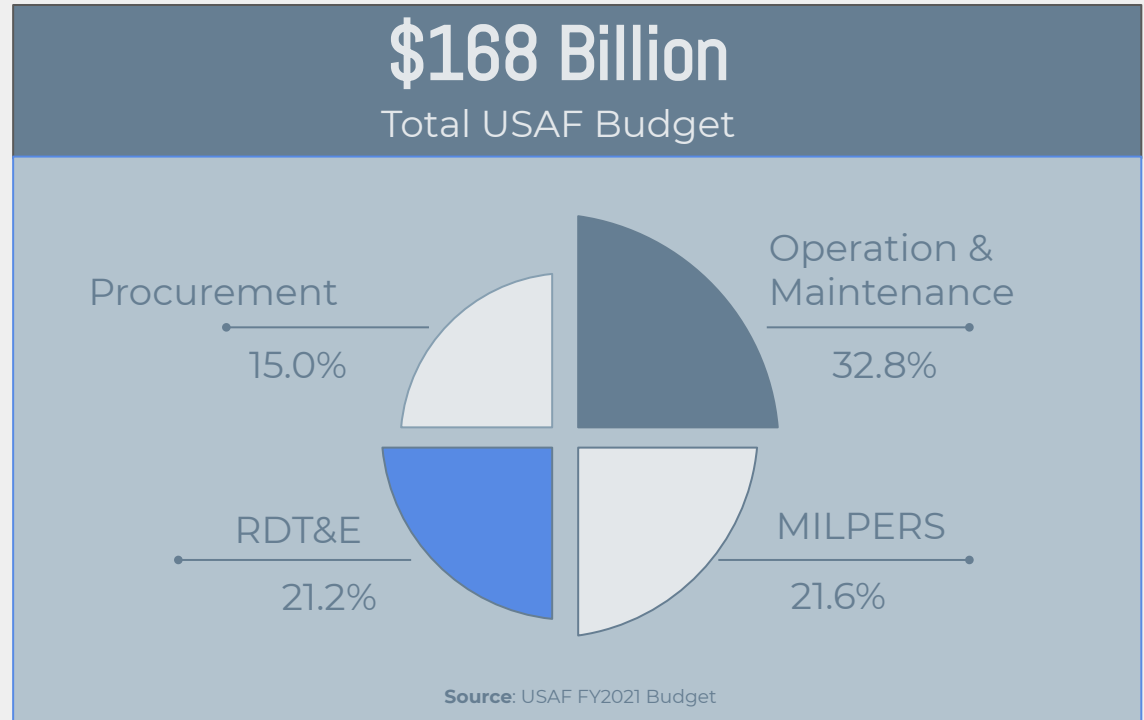
What is an RPA pilot **worth**?

	Per unit	**Total FY2021**
COST OF EQUIPMENT	$82.9 M	$6.34 B
COST OF TRAINING	Several Million	Millions x 800 RPA pilots
HUMAN CAPITAL	**PRICELESS**	---

Source: USAF FY2021 Budget

Obstacle 2: Air Force **culture neglects RPA pilots**, revolving around fighter pilots instead

Fighter pilots dominate hierarchy as the Air Force's **prized specialization**

RPA pilots do not get the same **recognition** or **awards**

RPA pilots are not **promoted** at comparable rates

RPA pilots are **underappreciated** by Air Force leadership

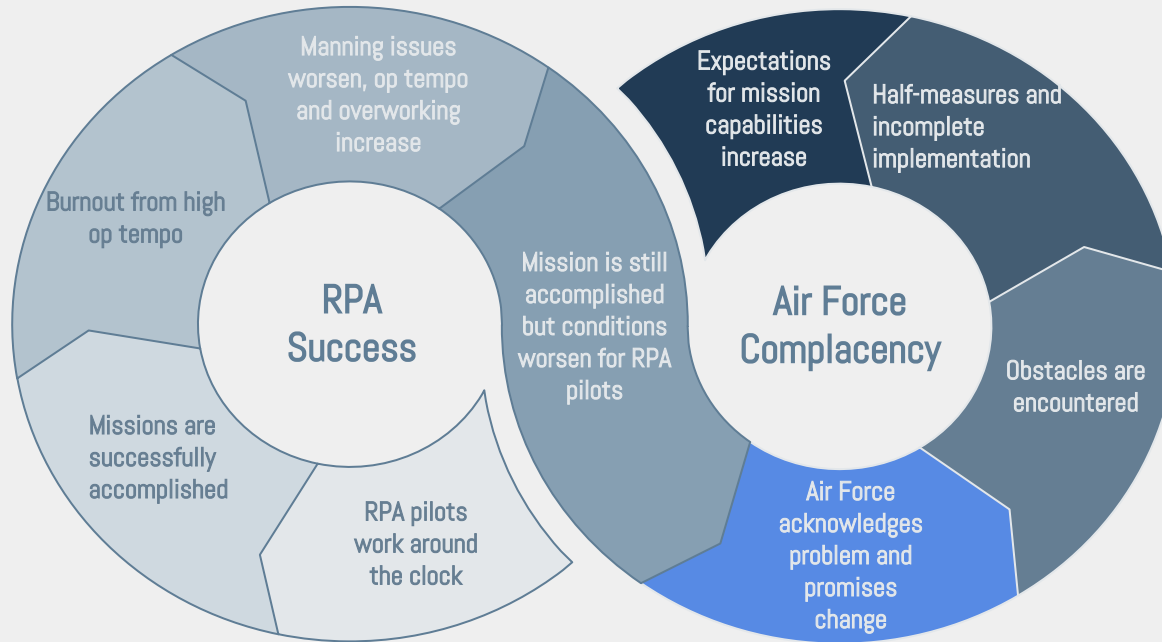RPA pilots remain **undervalued** and **underrepresented**

"The Air Force public affairs office never lets anyone know the value of what we do."

— RPA Pilot, 2018 RAND Study

Obstacle 3: RPA pilots, despite adversity, still get the job done, enabling Air Force **complacency with the struggling program**

RPA Success
- Manning issues worsen, op tempo and overworking increase
- Burnout from high op tempo
- Missions are successfully accomplished
- RPA pilots work around the clock
- Mission is still accomplished but conditions worsen for RPA pilots

Air Force Complacency
- Expectations for mission capabilities increase
- Half-measures and incomplete implementation
- Obstacles are encountered
- Air Force acknowledges problem and promises change

The Culture and Process Improvement Program (CPIP) exemplifies a **weak** and **failed** initiative that is touted as successful and complete

CPIP > OFFICIAL STATUS

> Air Combat Command (ACC) established the CPIP in 2015 to **identify and address stress** and quality of life issues within the MQ-9 Reaper RPA community

> Effort collected **nearly 2,500 inputs** from the RPA community through surveys and in-person engagement

> Developed **over 140 initiatives** to address concerns regarding missions, quality of life, locations and basing options, training, etc.

> June 2019: The Air Force has achieved an "**almost 90% solution**"

90%

CPIP > ACTUAL STATUS

> Initiatives **no longer tracked** because they have "reached the point of diminishing returns" and **CPIP office closed**

> "Completed" = **handed over** to someone else

> **Unfulfilled initiatives** include combat-to-dwell, security clearances for medical and chaplain personnel, and spousal and child support

> GAO: The completion and solution discussed in June 2019 "**may not present a transparent accoun**t of what has been completed and what remains to be accomplished"

???%

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High RPA operations tempo and success rates **speak for themselves**

9,100
Drone sorties from 2016-2018

1,800
Number of drone strikes from 2016-2018

~100%
Successful strike rate 2016-2018

Source: The Bureau of Investigative Journalism

""If you look at all the stress we have on the [RPA] pilots that are at Creech – six days on, 12-hour shifts, in combat, 72 hours a week without a break. Then they have to drive all the way back to [Las] Vegas where their families are, it's just a huge, huge stressor.""

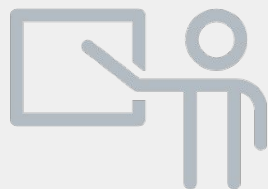— Gen. John Hyten, Air Force Space Command, 2017

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RECOMMENDATIONS

Promotion pathways for RPA pilots boost representation in Air Force leadership and provide opportunities for growth

RPA Recruitment Pipeline

The Air Force does not have a designated RPA recruiter, and it does not demonstrate prioritization of recruitment based on specific mission needs.

Effective Instruction

Required instruction staff numbers are understated because they are based on a dissimilar program over a decade old.

RPA Promotion Pathway

RPA compete with fighter pilots for the same promotions. This is counterproductive.

Behavioral health support prioritizes human capital and boosts RPA pilot resiliency

CHAPLAINS & PSYCHOLOGISTS
Prioritize mental health by ensuring capacity for post-strike, one-on-one check-ins

SECURITY CLEARANCES
Increase allotted security clearances for support team members

FAMILY
Integrate pilot spouses and children into mission support and health considerations

TEAM EFFORT RECOGNIZED
Invest in family care and support initiatives, including childcare

BASE COMMUNITY
Promote opportunities for team bonding and squadron cohesion on base

CAMARADERIE
Mandatory stand-down days and off-days to boost morale and team mentality

Logistics & scheduling improvements mitigate operational burnout and optimize mission readiness

FLIGHT LINE MANDATES

Mitigate operational burnout by stemming demand to fit existing supply of flight lines and personnel.
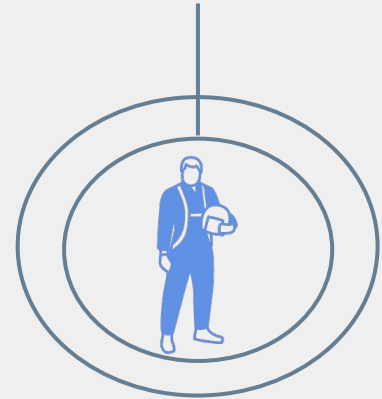
COMBAT-TO-DWELL

Improve existing policy so that RPA pilots are not "on call" during dwell cycle.
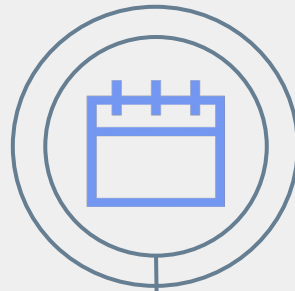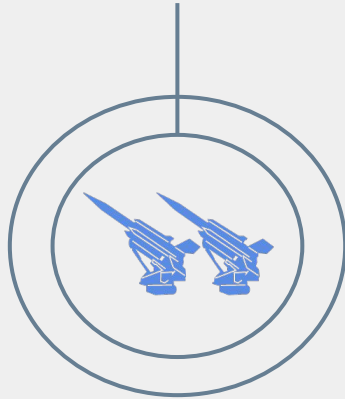
SCHEDULING

Slowing op tempo and extending shifts allows for healthier sleep patterns, and changing shifts for time of year.

QUESTIONS?

OUR TEAM

CAROLINE STILL
4th Year
Majors: Global Security &
Justice, French

THIEN-KIM DINH
3rd Year
Major: Leadership &
Public Policy

KAYLEE MOORE
3rd Year
Majors: Foreign Affairs
& History

STROTHER CECH
4th Year
Majors: Foreign Affairs
& History

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4. RPA suicide ideation
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Backup Slides

RPA demand and advantages

RPA recruitment

Global focus

Operational factors

Psychological factors

Moral injury

Air Force suicide

Behavioral health support

Leadership profiles

Attempted improvements

Scheduling breakdown

Flight line mandates

Combat to dwell

Burnout factors

Promotion rates

RPA demand is **high** and **increasing**

Stealth

Unlike manned aircraft, RPAs are quiet and can remain undetected at an altitude of 25,000 feet for extended periods of time.

Supports a variety of different missions

RPAs can be extremely valuable assets in nearly any mission. This might include ISR, targeted strikes, or ground mission overwatch.

High demand for RPAs that is only going to increase over time.

In the age of technological innovation, remote warfare technology is going to play an increasingly larger role in the world. More and more CAPs are going to be needed for mission support.

Addressing the issue of resilience before it grows out of control is critical.

Keep troops out of physical danger

Traditionally, certain missions have required American troops to be physically on the ground. RPAs help mitigate that risk.

Multiple advanced capabilities

RPAs like the MQ-9 Reaper have a variety of advancing sensing and kinetic weapons capabilities, making them extremely versatile.
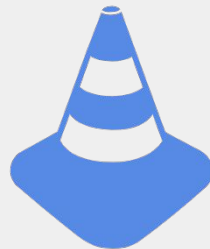
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RPAs have **two distinct recruitment and training pathways** that lead to a **common frustration**

UNIVERSITY PIPELINE

Recruits from ROTC, service academies, and Officer Candidate School.

Complete traditional fighter pilot training, then tasked with RPA.

CAREER RPA PIPELINE

Recruits intend to become RPA pilots, but they are given minimal information on career realities.

Complete RPA specific pilot training.

FRUSTRATION

University recruits are **disappointed** to pilot unmanned aircraft. Career recruits feel **misled.**

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In the changing nature of war, drones are **increasingly vital**

> US spends 57 percent of unclassified R&D funds on UAV technology in next decade

> Near peers like Russia and China are investing in drones too, and their programs are catching up

UAV Production by Region: Current and Projected Values

Country/Region	2017		2026	
	$ Millions	# of Units	$ Millions	# of Units
USA	1,755	1,179	4,400	2,530
Asia-Pacific	1,092	724	2,523	1,134
Europe	714	666	1,524	972
Middle East	609	509	1,534	273
Africa	20	12	114	113
Americas	1	27	213	32

Source: 2019-2020 World Military Unmanned Aerial Systems Market Profile & Forecast, Teal Group

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The MQ-9 Reaper is extremely expensive to **build** and **operate**

UNIT COST PER CAP

$136.1 MILLION

COMPARED

F-16 Fighting Falcon **>** **$30.8 million**

A-10 Thunderbolt II **>** **$21.3 million**

MAINTENANCE COSTS PER YEAR PER CAP

$27.7 MILLION

COMPARED

F-16 Fighting Falcon **>** **$5.4 million**

A-10 Thunderbolt II **>** **$5.5 million**

Source: MQ-9's Cost and Performance, Wheeler, 2012

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The RPA mission consists of **unique operational factors**

Combat to Cul-de-Sac

> Continuous transition between war and peace
> Mentally at war
> Unable to fully meet work and home expectations
> Cannot discuss details of work while at home

Scheduling

> Long shifts and work weeks
> Constant state of "on-call"
> No end in sight for bad shift schedules
> No guaranteed breaks
> Inadequate decompression time

Poor Unit Cohesion

> Conflicting shift schedules Short-term planning
> Limited time to socialize outside of work, family is prioritized.
> Limited community events, less than ⅓ of squadron is able to attend.

Little Recognition

> Low promotion rates relative to manned aircraft
> Mentally at war, not considered deployed No combat awards / medals Few understand the implications of their job

Psychological factors contributing to **moral injury**

WITNESSING VIOLENCE

"We watch who we employ weapons on, then get the battle damage assessment, including seeing body parts...on the ground."

PARTICIPATING IN VIOLENCE

Failure to protect American troops, civilian casualties, no framework to rationalize kills, limited support.

HUMANITY OF TARGETS

Get to know the target's personal lives, day to day activities, food, family, etc, extensive surveillance allows for association with the enemy.

COMBAT INTIMACY

Constantly witnessing brutal acts of violence contributes to psychological stress. Continued surveillance from strike to funeral.

AVOIDING WEAKNESS

Stigma around usage of existing supports, loss of flight status, status in the community, losing a promotion.

What is moral injury?

In order for moral injury to occur, the individual must feel like a transgression occurred and that they or someone else crossed a line with respect to their moral beliefs. Moral injury does not trigger a "fight or flight" response.

It is possible to have a moral injury and not meet the requirements for PTSD.

How is it different from PTSD?

There is a great deal of overlap between moral injury and PTSD, but they are exclusive conditions. For PTSD, a trauma happens to an individual. For moral injury, the individual undergoes a morally challenging ordeal.

The treatment methods for PTSD, such as revisiting the trauma, do not work for moral injury.

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Behavioral health support for the RPA community is lacking

HUMAN PERFORMANCE

> August 2019: Psychologist **position unfilled** for over 9 months

> Team members physically located at Creech, but also **responsible for all bases** under the same wing (Ellsworth in South Dakota, Whiteman in Missouri, and Shaw in South Carolina)

> **Chaplain: assigned responsibility for more than 3,000 people at a time**
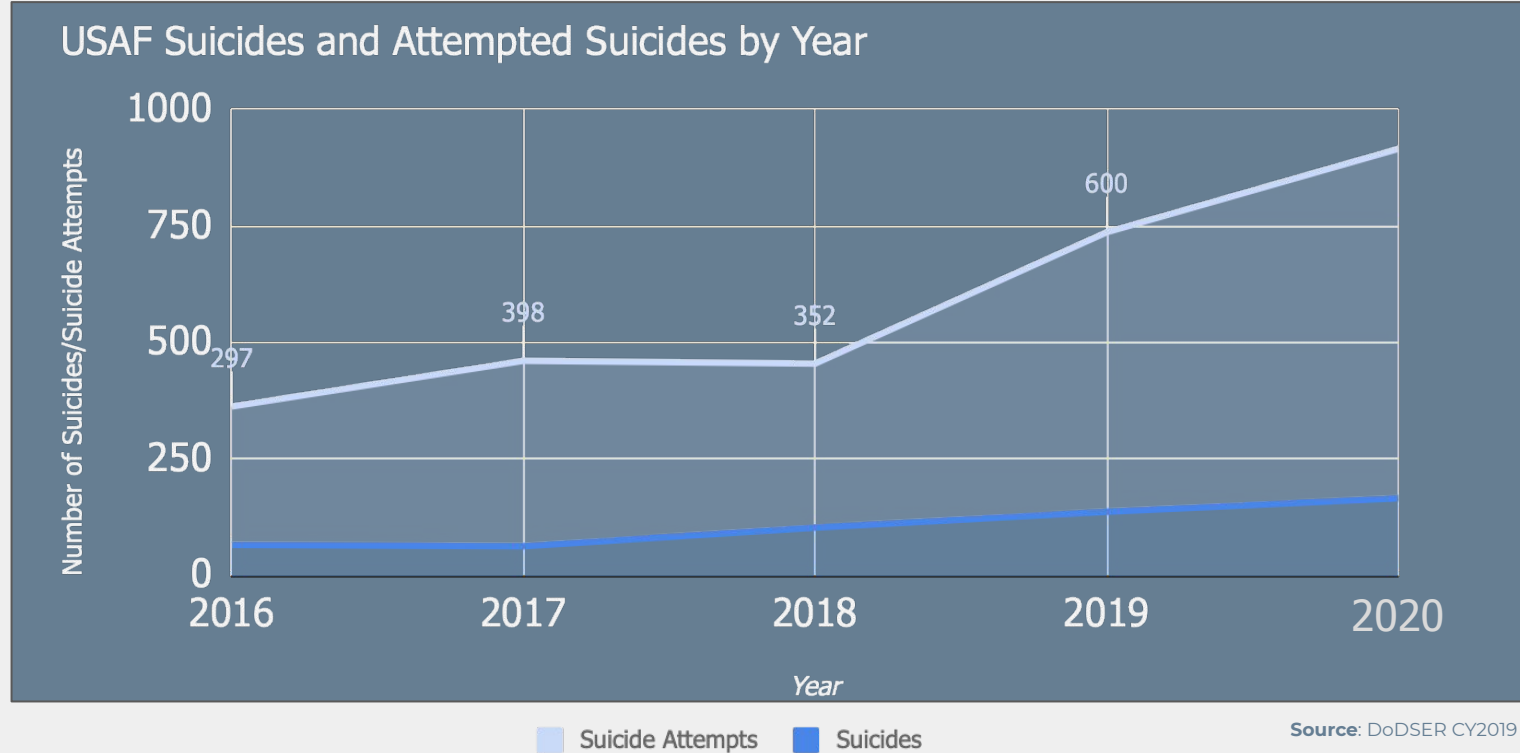
MEDICAL SERVICES

> Shaw Air Force Base: **supposed to have** six medical technicians and two doctors, actually has **only TWO** medical technicians for RPA community

> Creech Air Force Base: **20, 714 man-hours** are **wasted** each year due to personnel needing to obtain medical services, the equivalent of **losing 11.5 people** in a given year

CHILD CARE

> Across RPA community: Childcare services **"low quality"** and **limited** for 24/7 shift workers

> Cannon Air Force Base: has two Child Development Centers, only operate Mon-Fri from 6am to 6pm, long waiting list for admission

> Creech Air Force Base: **NO childcare on base**

The Air Force has an **increasingly dire** suicide problem

USAF Suicides and Attempted Suicides by Year

Number of Suicides/Suicide Attempts

1000

750

600

500
297   398   352

250

0

2016   2017   2018   2019   2020

Year

Suicide Attempts   Suicides

*2019 and 2020 suicide attempts are projected values

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Leadership profiles reveals **dominance** of **fighter pilots**

Command	Commander	Flight Experiance
Air Combat Command	Gen Mark D. Kelly	T-37, T-38, F-15E, F/A-18, F-16, F-35A
Air Education and Training Command	Lt Gen Marshall B. Webb	UH-1H/N, MH-53H/J/M, CV-22B, MC-130H, MC-130P
Air Force Global Strike Command	Gen Timothy Ray	T-37, T-38, B-52G, B-52H, B-1B, C-21, C-27A and C-208.
Air Force Materiel Command	Gen Arnold W. Bunch Jr.	B-52, B-2, KC-135, F-16, T-38
Air Force Reserve Command	Lt Gen Richard W. Scobee	F-16
Air Force Special Operations Command	Lt Gen James C. Slife	MH-53, MQ-1
Air Mobility Command	Gen Jacqueline D. Van Ovost	C-32A, C-12C, C-17A, C-23A, C-141B/A, KC-135R, F-15B, F-16B, T-1A, T- 37B and T-38A
Pacific Air Forces	Gen Kenneth S. Wilsbach	F-16C, F-22A, MC-12W, F-15A-D, T-38, T-37
United States Air Forces in Europe – Air Forces Africa	Gen Jeffrey L. Harrigian	F-22, F-15C, A/OA-37 and MQ-1

Source: Air Force Senior Leader Biographies, af.mil

Recent initiatives made **minimal** improvements with **limited** results

IMPROVEMENTS

- Expanded RPA operations to Shaw Air Force Base in South Carolina
- Decreased the number of combat lines
- Created new division at Air Force headquarters to oversee RPA personnel matters
- Established a medal to specifically recognize RPA contributions

RESULTS

- Did not address real underlying problems
- New base still not in desirable locations
- Dwell time still requested by senior base leaders
- RPA job duties don't align with reasons pilots joined Air Force
- Did not address career opportunity wishes

Potential schedule changes **optimize mission readiness**

Example of Current Schedule

➔ 5 week rotations (days, nights, mids).

➔ Rotate 10 times per year.

➔ Three teams: Red, White, Blue

➔ 5 days on, three days off.

➔ Can get called in on days off.

➔ 6-8 hours spent flying

➔ Upgrades, testing, meetings done daily before/after flying.

Potential Schedule Changes

➔ Longer rotations, 12-16 weeks (days, nights, mids).
➔ Rotate every 3-4 months (i.e. combat to dwell).
➔ 2 teams
➔ Training, upgrades, testing, meetings all done during "dwell" period.

Comparative Advantage

➔ Slower operations tempo.
➔ Healthier.

➔ Better long-term planning.
➔ More consistent.
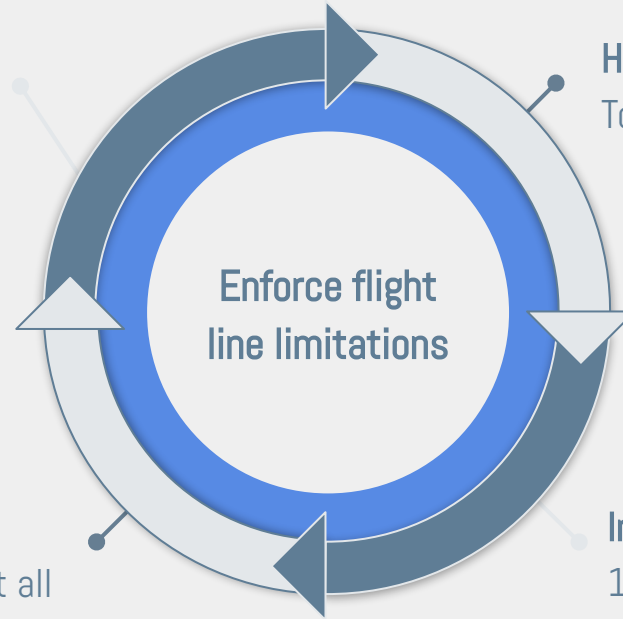
Flight line mandates mitigate operational burnout

Prioritization of human capital.
Ex: 50 pilots available to fly. Rather than lowering manning ratio, only 5 CAPS fly until team change-out or the 5 return to fly during their tour.

High and increasing demand for RPAs.
Total 65 CAPs, 2-6 per squadron.

Enforce flight line limitations

People-first mindset.
Maintain minimum manning ratio at all times.
Ex: 60 pilots for 6 CAPS.

Insufficient manning.
10:1 ratio of aircrew to CAP. Some operate below this ratio.

Combat to dwell **prioritizes human capital**

1:1 ratio

Functions exactly like deployment to dwell.

> 2-3 months in combat, or 8-12 weeks.
> Aircrew in combat are responsible for flying, and nothing else.
> Hours are long, and op-tempo is high, but there is an "end in sight."

2 teams

At all times, half the squadron is in combat, and the other is in dwell.

> Dwell period cannot be touched without higher authority signing it off at a minimum of 1:1 ratio.
> Dwell time is used for training, upgrades, testing, meetings, and other duties.
> Only 40 hour workweek while in dwell.

3 benefits

Improving mission readiness and efficacy by mitigating personnel burnout.

> Minimizes constant transition between war and peacetime.
> Gives RPA personnel a break. Prevents overworking, improves family life.
> Smaller units and consistent schedules improve unit cohesion.

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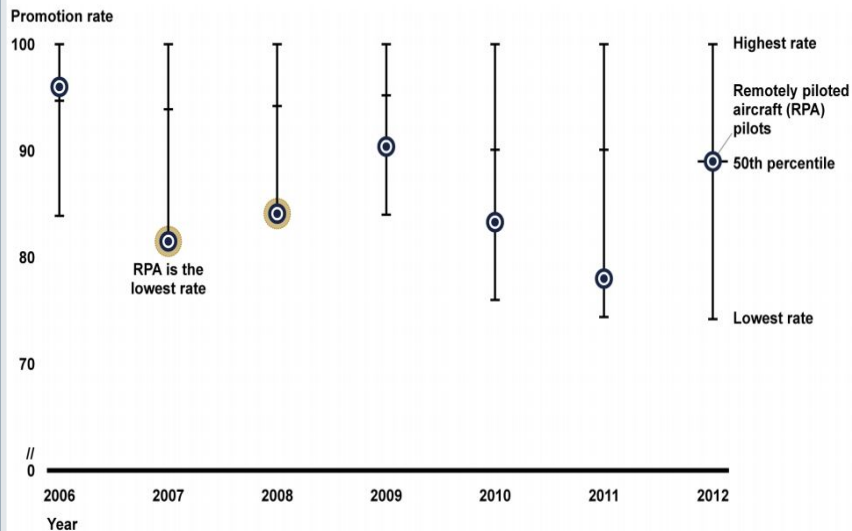
Promotion rates have improved, but there is still **progress to be made**

Figure 5: The Rates of Promotion to Major for Pilots of Remotely Piloted Aircraft (RPA) Compared to Other Air Force Officer Careers, 2006 to 2012

Source: GAO, "AIR FORCE Actions Needed to Strengthen Management of Unmanned Aerial System Pilots," April 2014

Figure 2: Promotion Rates from Captain to Major for Remotely Piloted Aircraft (RPA) Pilots Compared with Pilots in Other Career Fields from 2006 through 2017, Except 2013
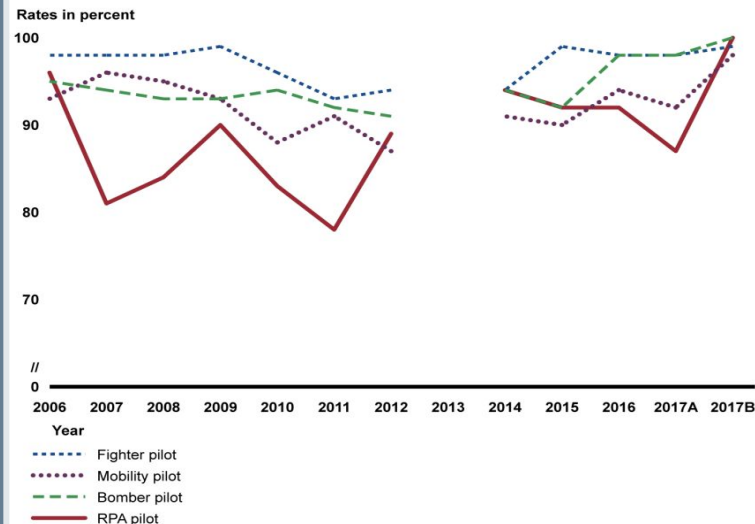
Source: GAO, "UNMANNED AERIAL SYSTEMS Air Force Pilot Promotion Rates Have Increased but Oversight Process of Some Positions Could Be Enhanced," February 2019