



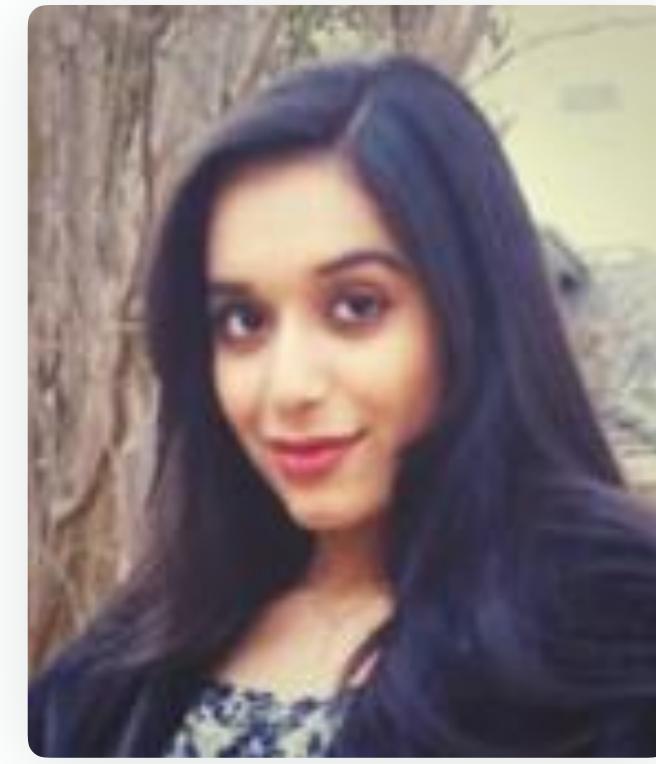
Patterns of Life



Stefan  
Niculae



Brandon  
Wexler



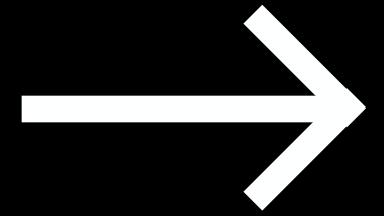
Madhuri  
Jujare



Dubem  
Nwoji



Lauren  
Becker



"Patterns of Life"

Actual tool

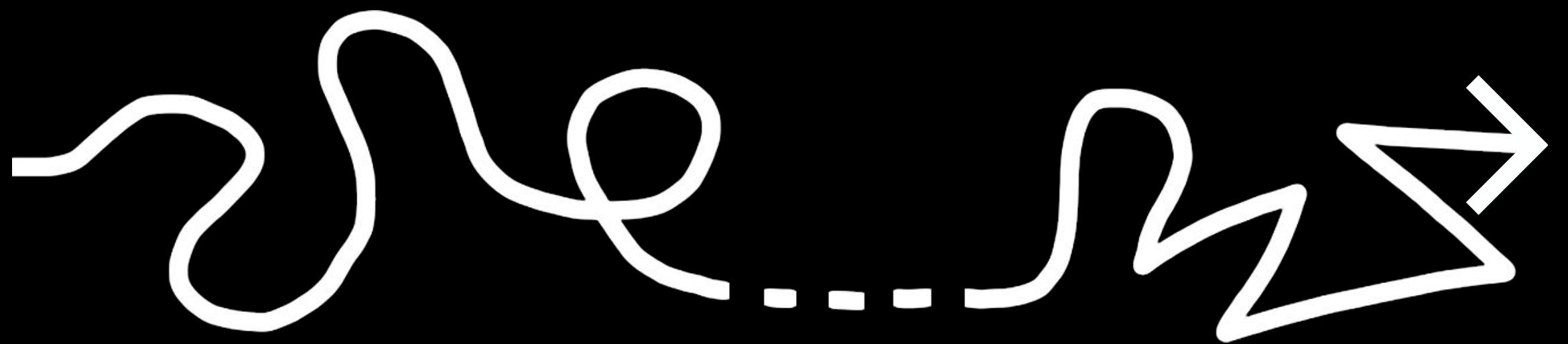


"Patterns of Life"

Actual tool



"Patterns of Life"



Actual tool



the problem

## REMOTE PILOTED AIRCRAFT



control

Creech, Nevada

Afghanistan



PILOT & SENSOR OPERATOR

live video

SCREENER



provide  
intel



REMOTE PILOTED AIRCRAFT



should  
not hit



PILOT & SENSOR OPERATOR



CIVILIANS

current approach:

TOOLS, TRAINING,

**EXPERIENCE**







**7178**

WEAPONS RELEASED

**4121**

CIVILIAN CASUALTIES

by the US Air Force in Afghanistan, in 2018

# CONSEQUENCES

1. Civilian lives
2. Retaliation
3. Foreign relations
4. Public image
5. Personnel morale

current approach:

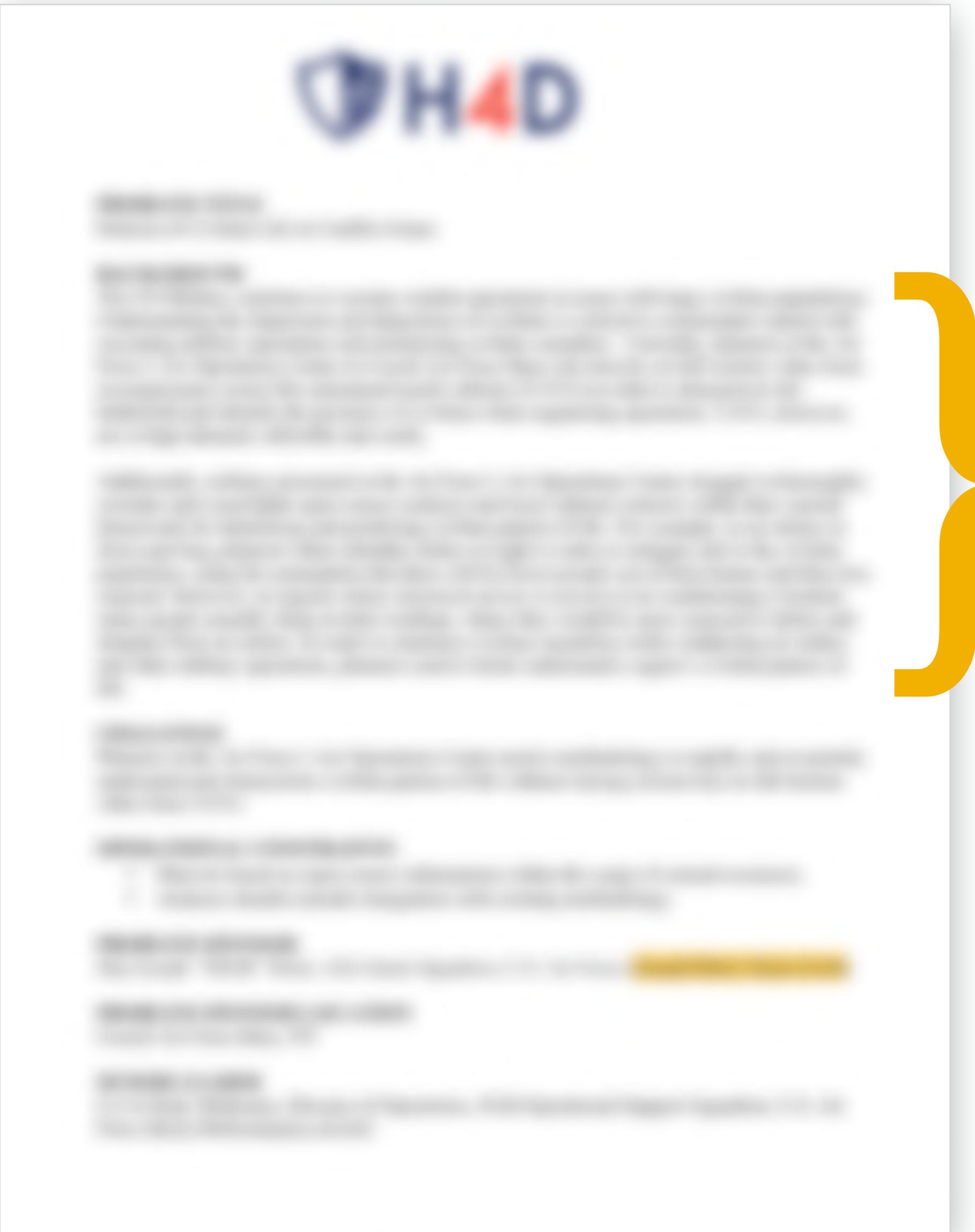
TOOLS, TRAINING,

EXPERIENCE  
NOT TRANSFERRABLE





the journey





میں وزارت معاشر اسلامی و فناہیت

### Minimal Viable Product

Population density baseline estimator  
(used by AOC Planners for long-term planning)

- Input: previous operation logs
- Output: how factors influence civilian density
- Used in various stages of development

Cultural      Natural      Facilities      Technology

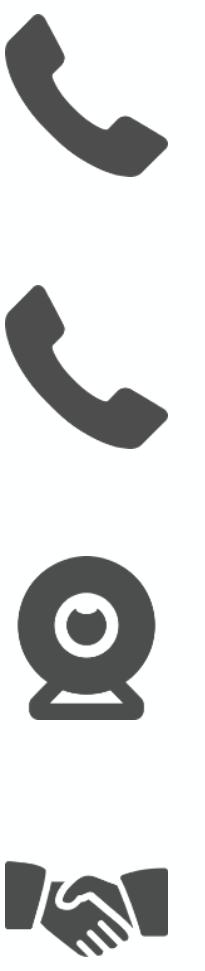
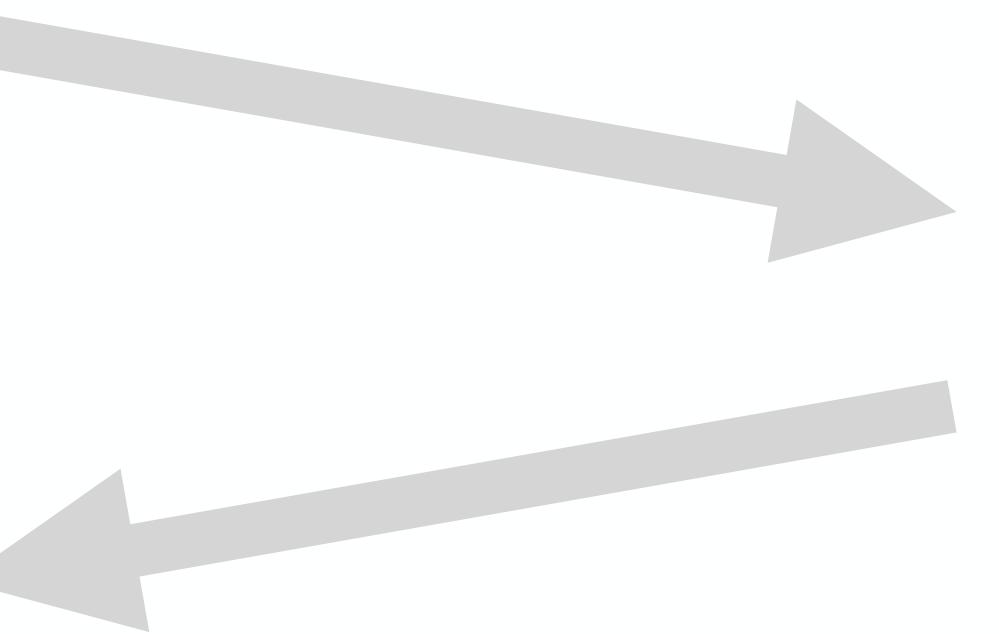
Chance of civilians: 35%  
Confidence: 95%  
Factors: near school, after sundown, not raining, bus just left, no holidays, low network traffic.

Civilian count normality classifier  
(used by RPA Pilot for short-term confirmation)

- Input: instant observations
- Output: normal/expected behavior

Observed      Expected      Abnormality detected!

Minimal Viable Product(s)



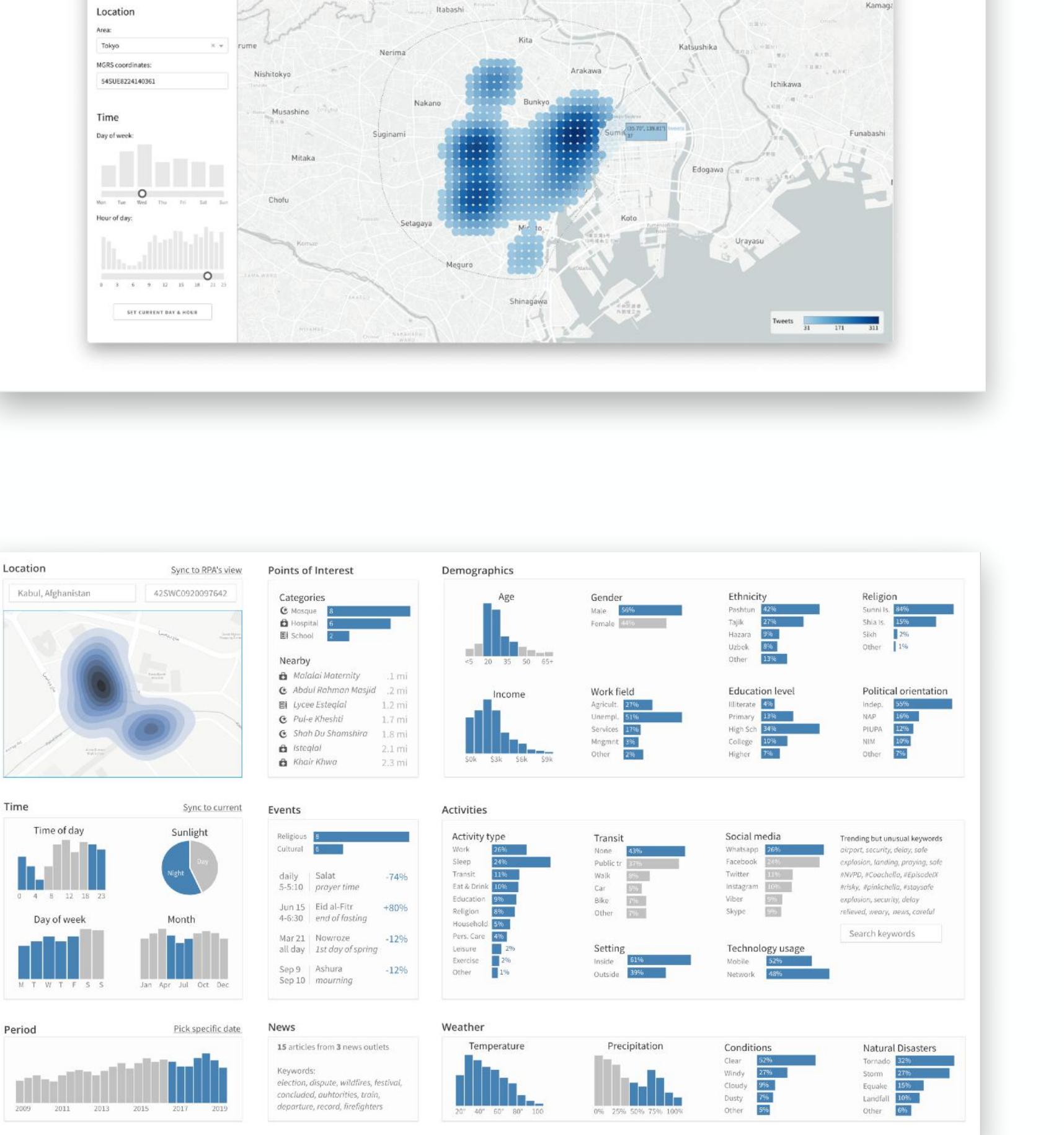
Maj. Ritter  
2nd Lt. Daugherty  
2nd Lt. Michaela  
SCapt. Carter  
Capt. Hutchinson  
Dr. Morstatter  
Maj. Rhodes  
Lt. Elliot  
Capt. Hutchinson  
SFC Huynh  
M-1 Division

A1C Sassman  
 2Lt. Daugherty  
 Lt. Col Ashok  
 Dr. Becker  
 Maj. Ritter  
 1Lt. Murphey  
 SCapt. Adams  
 A1C Sassman  
 2Lt. Daugherty  
 SSgt. Brown  
 Dr. Morstatter  
 Lt. Elliot  
 Capt. Davis  
 SrA. Weyland  
 1Lt Dutcher  
 A1C Sassman



# 91

## INTERVIEWS

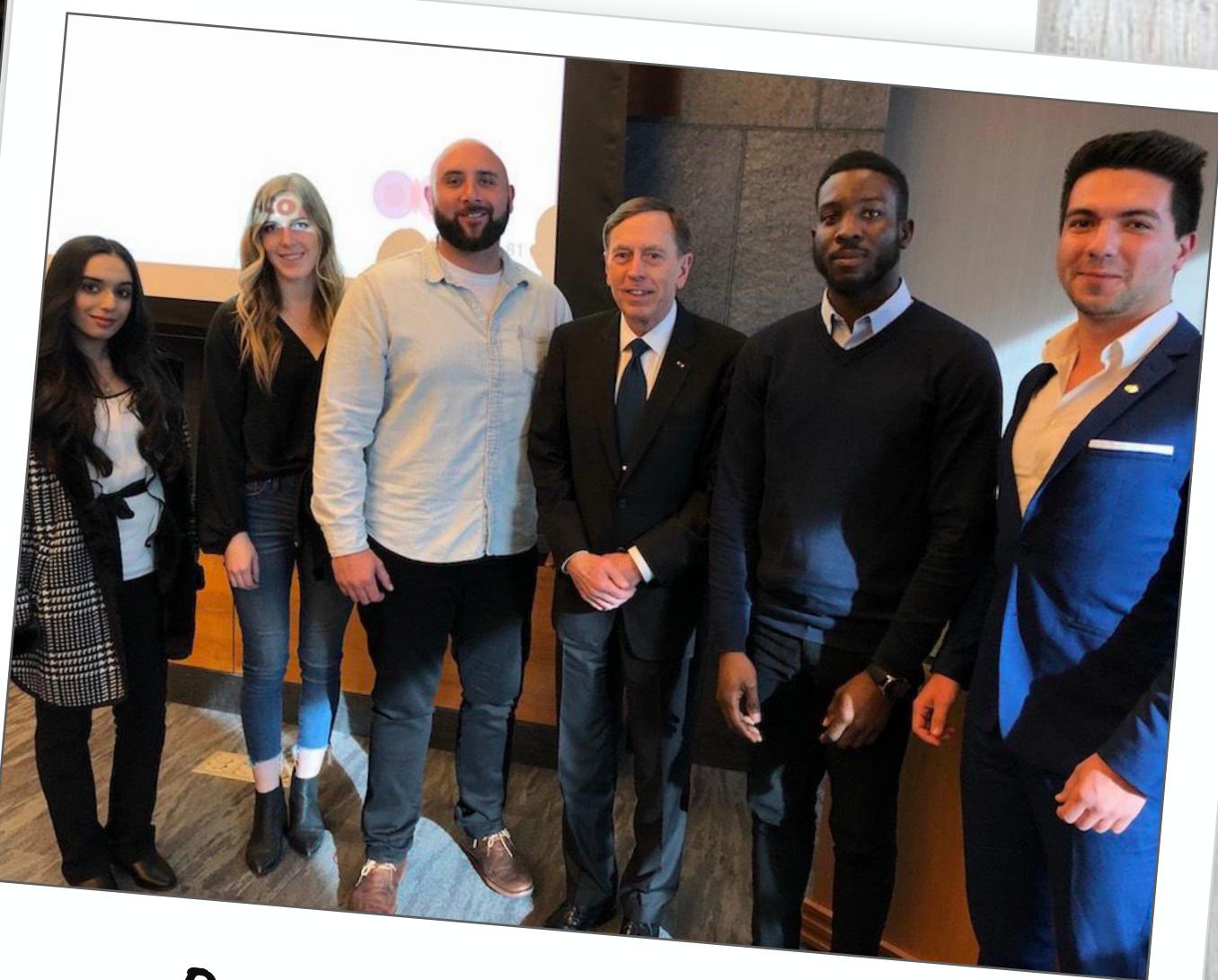




Thinking about



Driving to Creech



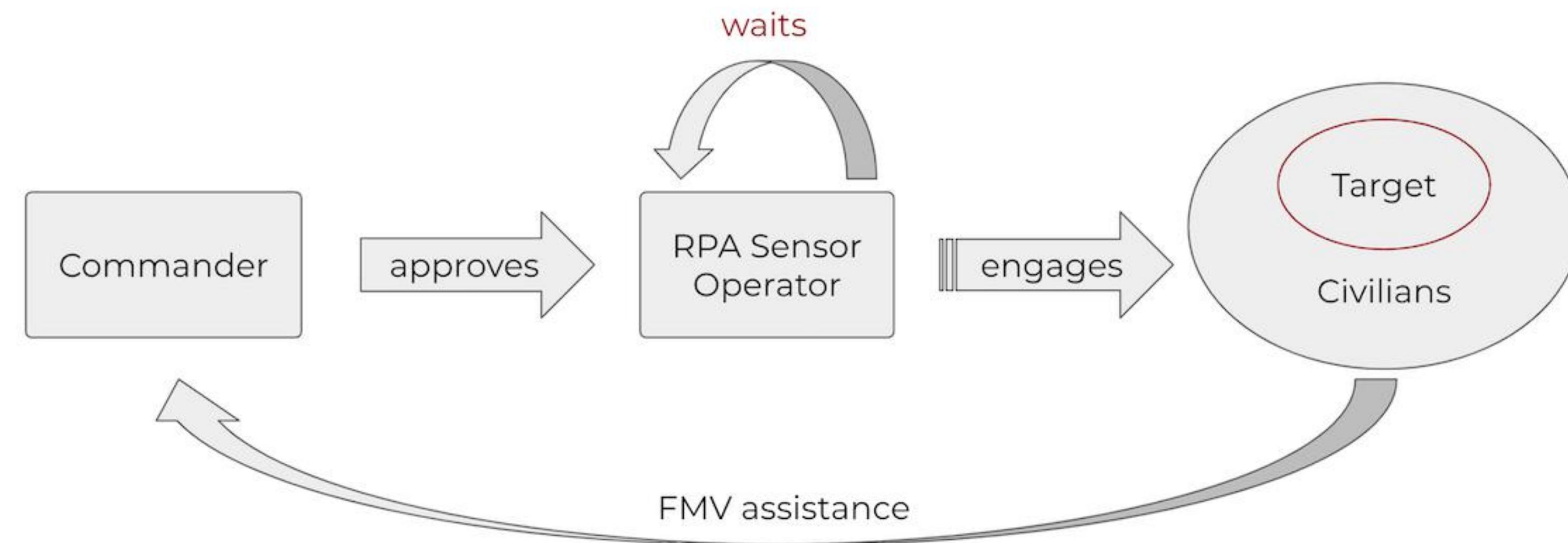
Presenting to Gen. Petraeus



Meeting our problem sponsor

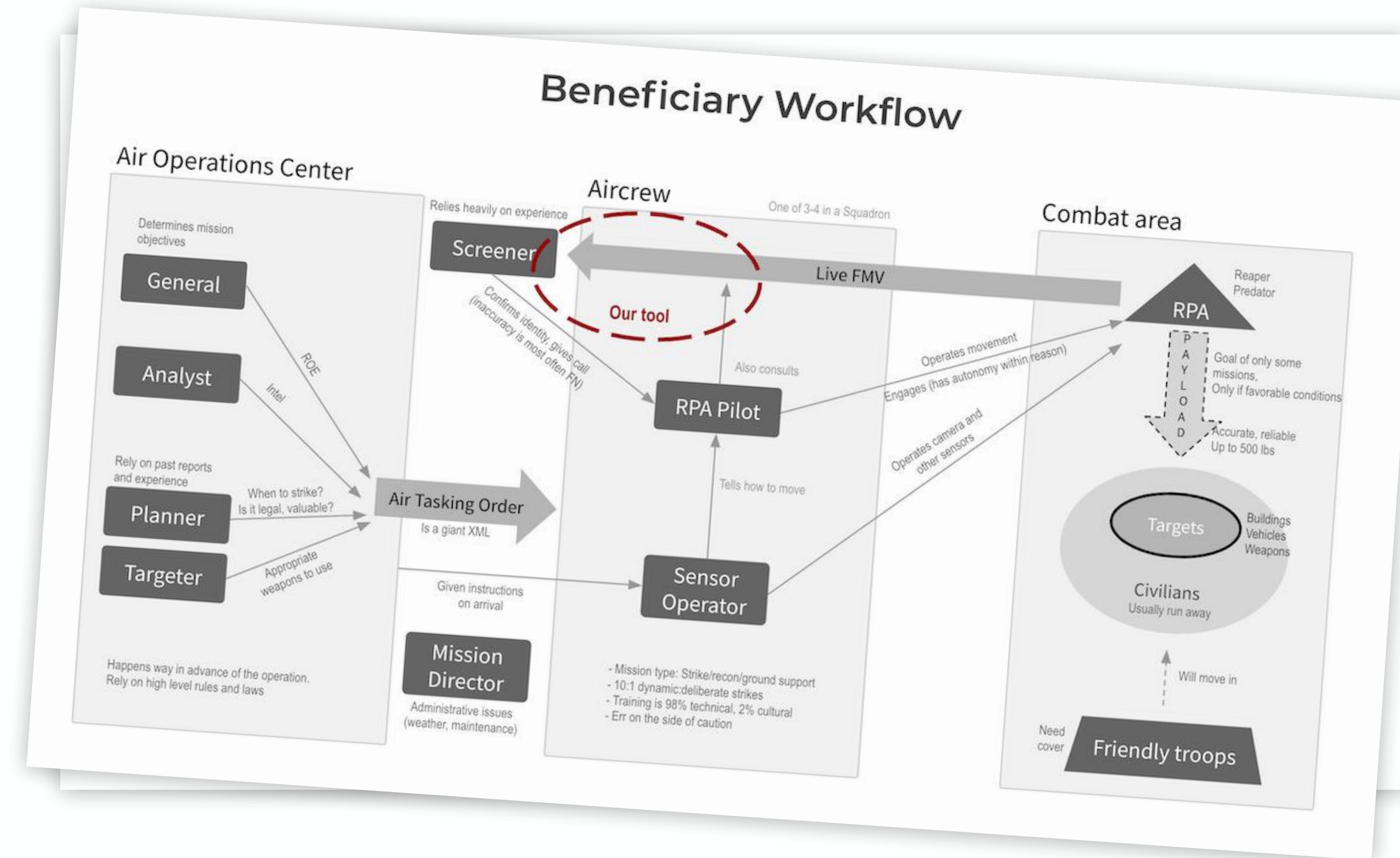


# Choice Diagram



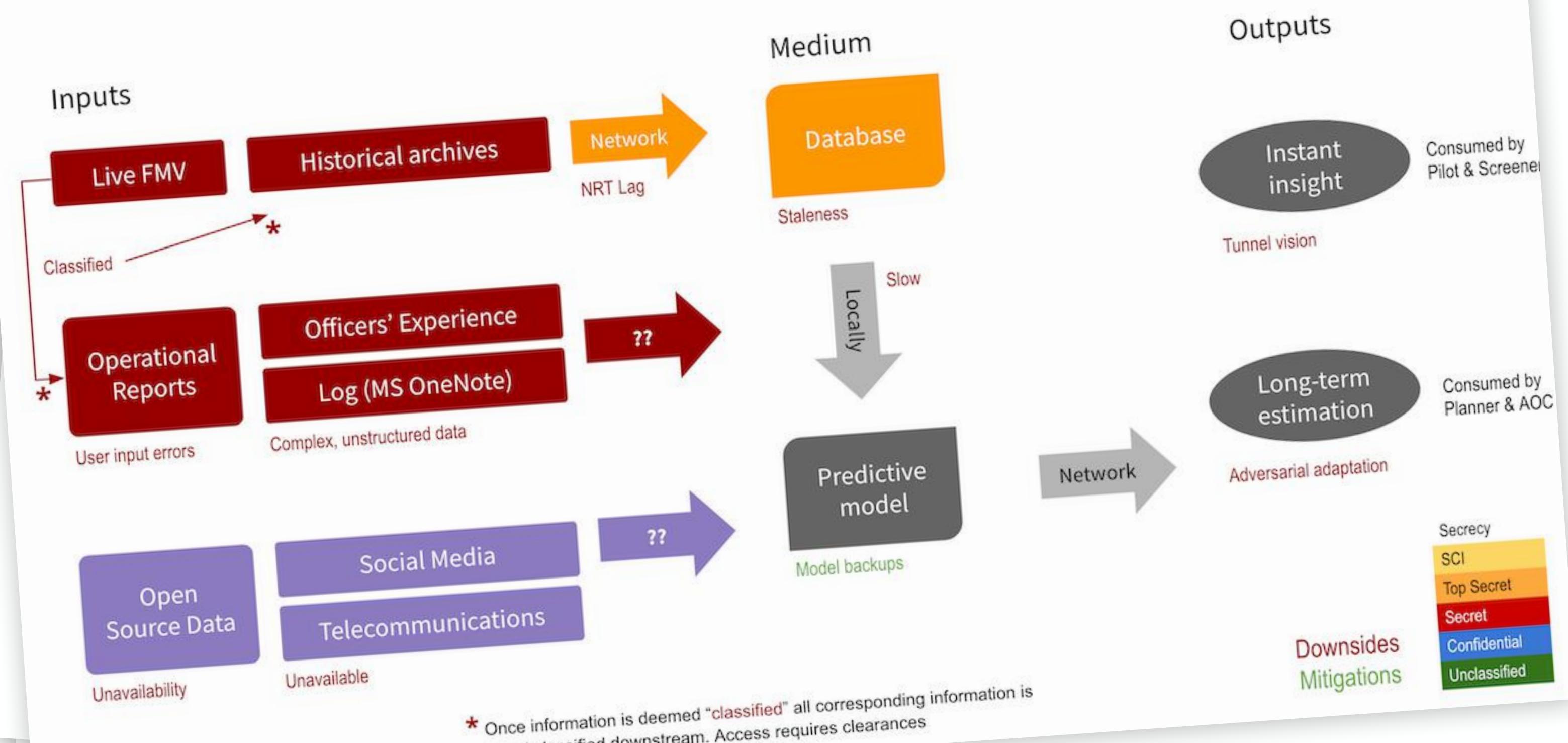
**AND**

## Beneficiary Workflow



AND SOME

## Information Architecture Diagram



# AND SOME PLANNING

## Beneficiary Archetypes

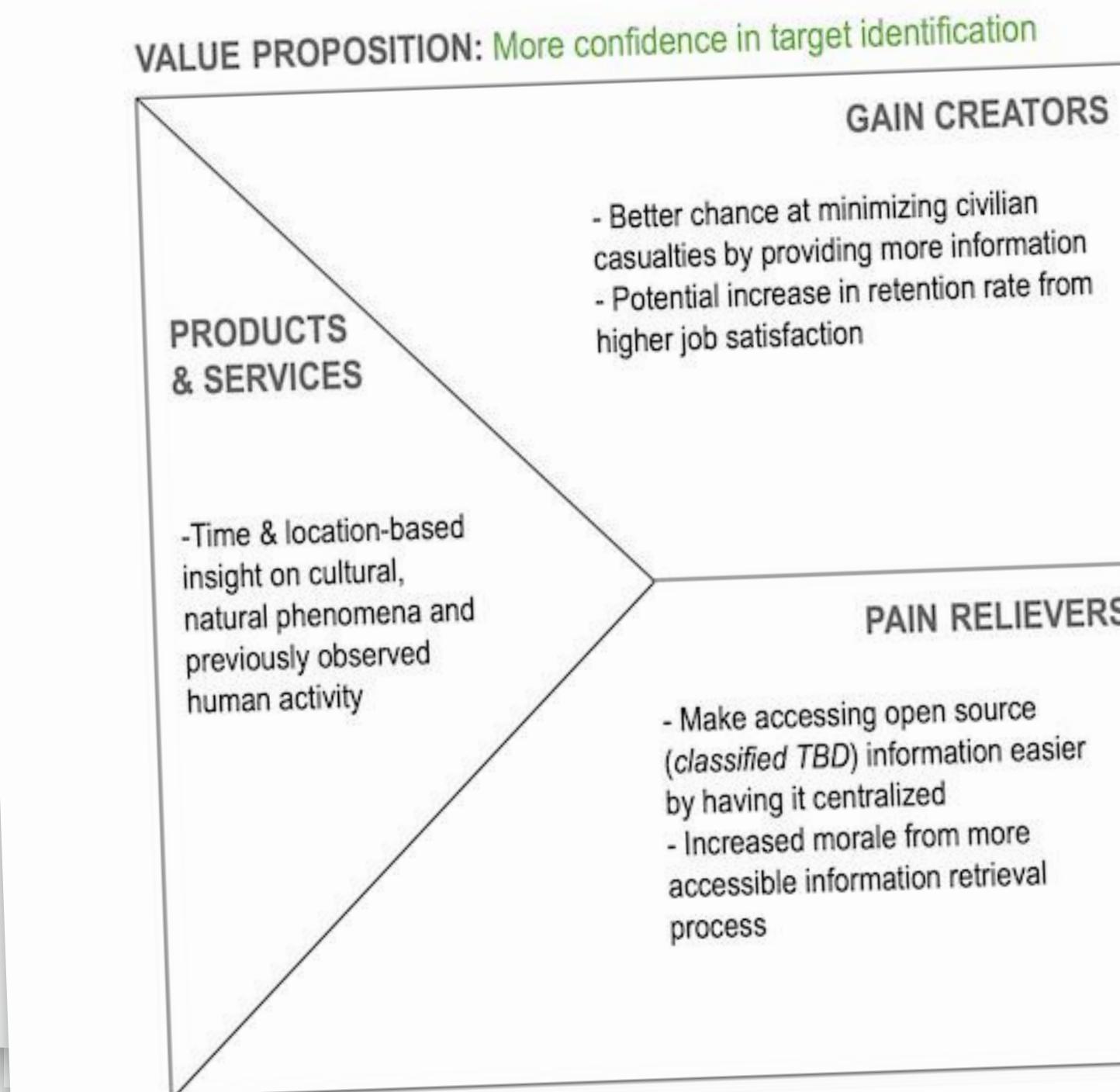


Job	RPA Pilot	Director of Operations	Intelligence Analyst
Demographics	81% men 35% minorities		78% men 27% minorities
Upbringing	[Officer] College degree, SAT	[Executive] BS degree in business administration (MBA preferred), 5+ years experience managing finances, operations/strategies	[Officer] College degree, SAT
Wants	A successful mission with decisions made efficiently	Growth and profitability of organization	Provide the most accurate information
Personality traits	Adaptable, dynamic thinker	Stellar management/people skills, ability to think outside the box	Investigative, multicultural, dynamic thinker
Reports to	Mission Director	AFWC (Air Force Warfare Center)	AOC Supervisor

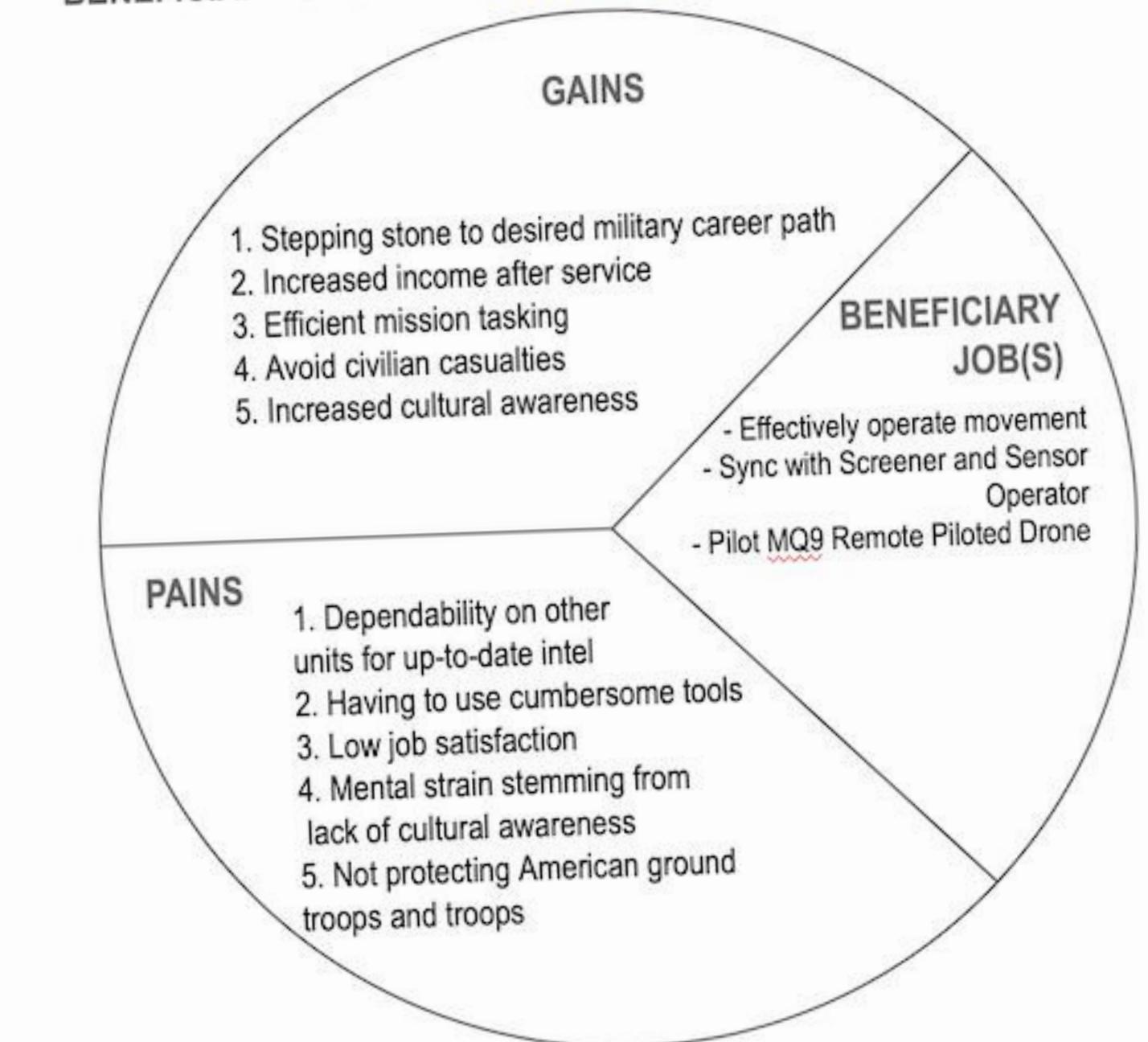
6

# AND SOME PLANNING.

## Value Proposition Canvas: Unit-Level Crew (and Intel Analyst)

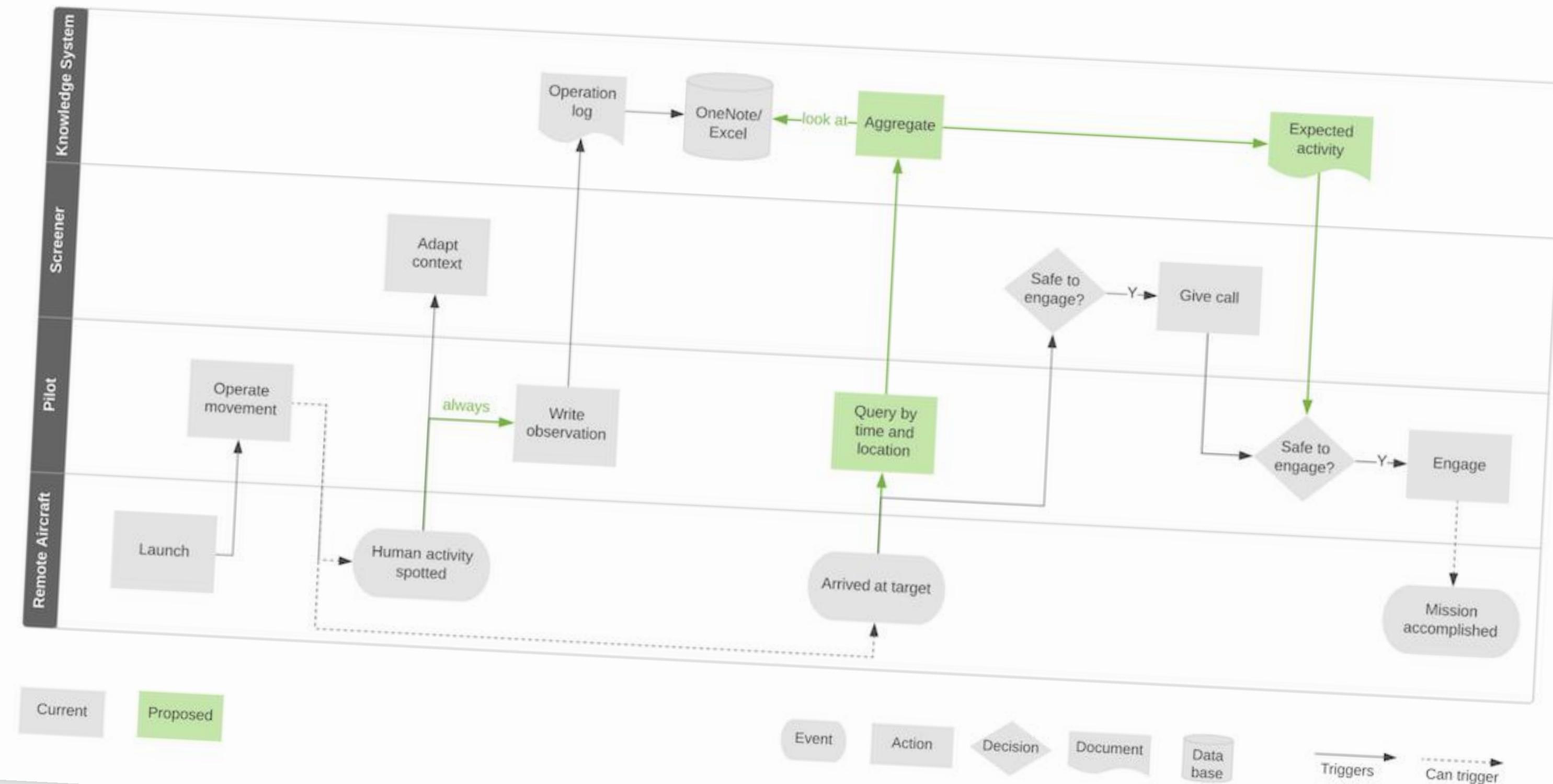


BENEFICIARY SEGMENT: 42nd Attack Squadron (and 9th Intel Op Grp)



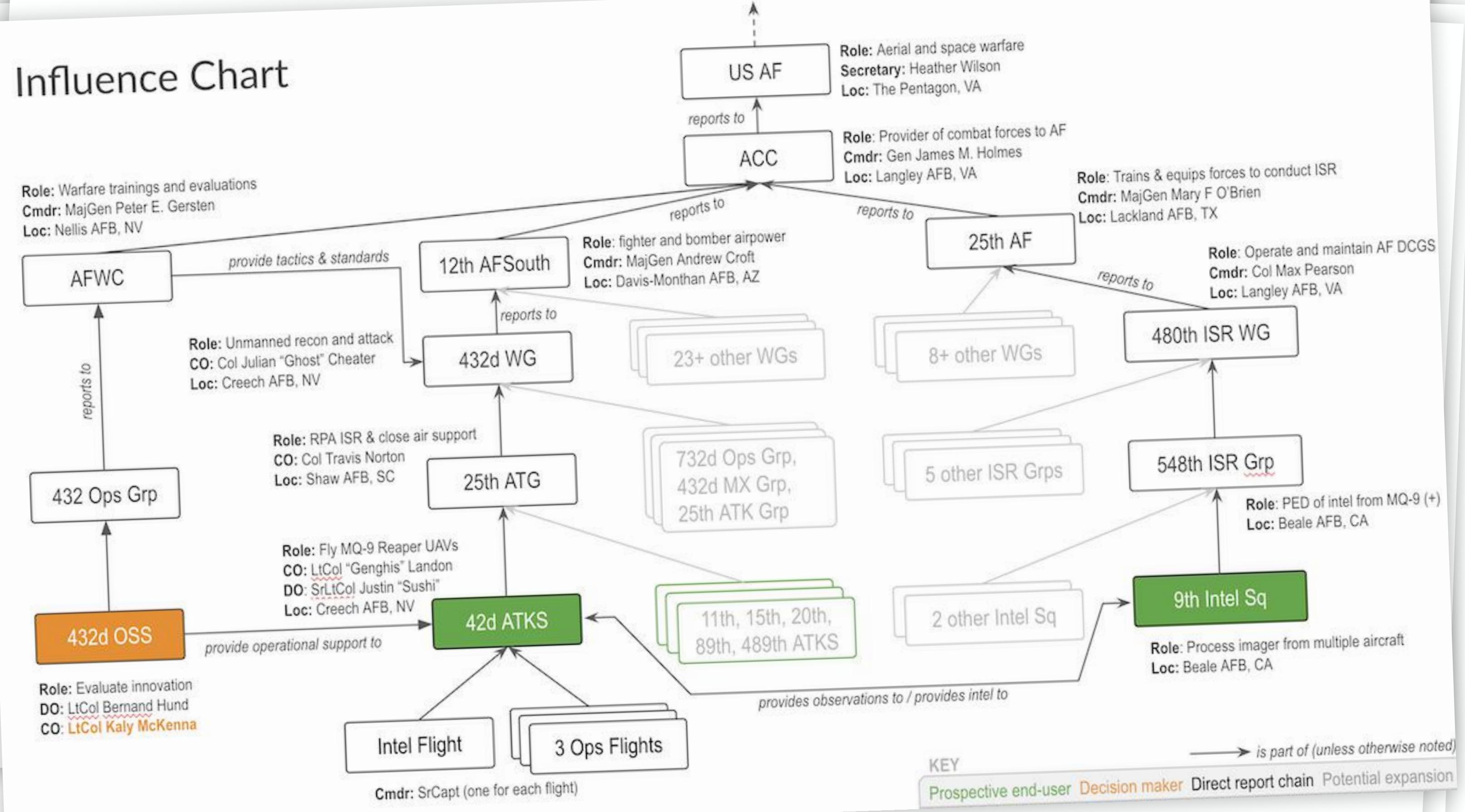
# AND SOME PLANNING..

## Proposed Workflow



AND SOME PLANNING...

## Influence Chart



# AND SOME PLANNING....

## Mission Model Canvas

Tactical   Operational   Strategic

<b>KEY PARTNERS</b> Maj Ritter (42 ATKS, Operations Administration, past: Mission Director, our problem sponsor)  MSgt Sjoholm (89 ATKS, Sensor Operator/Instructor)  BG Cheater (432nd Wing, Commander)  Lt Col Kaly McKenna (432nd Wing, Second in Command; DO of OSS)  Captain Rusinko (42 ATKS Flight Commander / Pilot)  SCapt Carter Adams (42 ATKS, Pilot)  SrA Weyland (432 WG, Sensor Operator)	<b>KEY ACTIVITIES</b> Understand current working conditions  Understand current Military efforts  Understand Afghan patterns of life  Clarify informational, operational constraints   <b>KEY RESOURCES</b> Operation log entries  Open source information	<b>VALUE PROPOSITION</b> More confidence in target identification  More efficient use of time during periods of high stress  Minimize civilian casualties during troop operations  Stronger foreign relations  Better domestic public image	<b>BUY-IN / SUPPORT</b> Tailored specifically to their workflow  Interpretability  Consistency with military regulations	<b>BENEFICIARIES</b> 42nd ATKS of the 432nd Wing RPA Pilot RPA Sensor Operator Electronic Combat Officer Director of Operations (DO)  9th Intel Squadron Intelligence Analyst/Officer Imagery Mission Supervisor  Air Forces Central Mission Director Flight Commander AOC Target Effects Coordinator  US Military Public Affairs Officer  Decision makers adverse to change ( <i>saboteur</i> )
			<b>DEPLOYMENT</b> Software solution that can be integrated into the existing mission system	
<b>MISSION BUDGET/COSTS</b> Our team: developer, PM wages, working space, working equipment Changing workflow during mission to introduce our tool Technical integration in their systems		<b>MISSION ACHIEVEMENT</b> Number of troops saved Insight into foreign cultures Foreign relationships maintained		

AND ~~SOME~~ PLANNING....

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Tactical   Operational   Strategic

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<b>MISSION BUDGET/COSTS</b> Our team: developer, PM wages, working space, working equipment Changing workflow during mission to introduce our tool Technical integration in their systems		<b>MISSION ACHIEVEMENT</b> Number of troops saved Insight into foreign cultures Foreign relationships maintained		

AND **MUCH** PLANNING...

NOT EXPLOITED

NOT EXPLOITED



00	46	83	74	29
45	73	38	99	25
54	91	85	40	71
10	30	62	49	71
32	4.32	8.32	7.32	2.32
.001	1.920	1.748	2.387	2.930
1.308	3.928	3.176	2.514	2.635
1.710	1.287	1.272	2.303	2.738
1.725	2.110	1.928	1.902	1.821
3	3.292	3.383	2.990	2.117
1.442	1.272	1.928	1.857	2.110
2.453	110	383	212	23
98	839	484	324	339
92	748	825	399	399
430	1.998	1.988	2.402	2.009
277	1.75	1.59	324	304
1.9	4.1	2.66	1.59	1.59
1	4.30	2.77	1.75	1.75

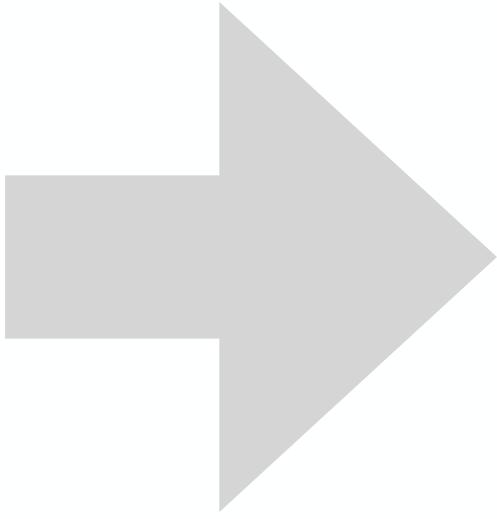




A close-up photograph of the iconic white, textured facade of the Sydney Opera House. The facade is composed of numerous small, white, diamond-shaped tiles. The perspective is from below, looking up at the building's roofline against a clear blue sky. Overlaid on the center of the image is the text "our solution" in a large, bold, black sans-serif font.

our solution

- Inefficient logs search
- Untapped open source



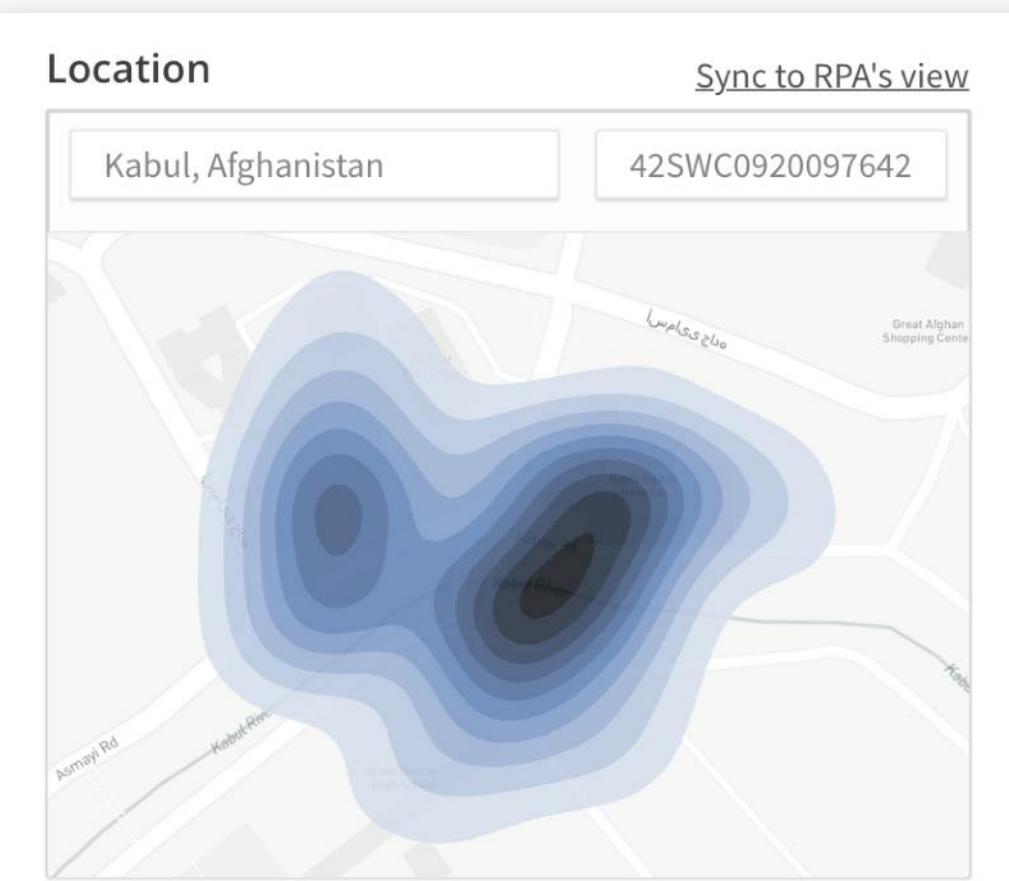
- Faster checking
- More confidence



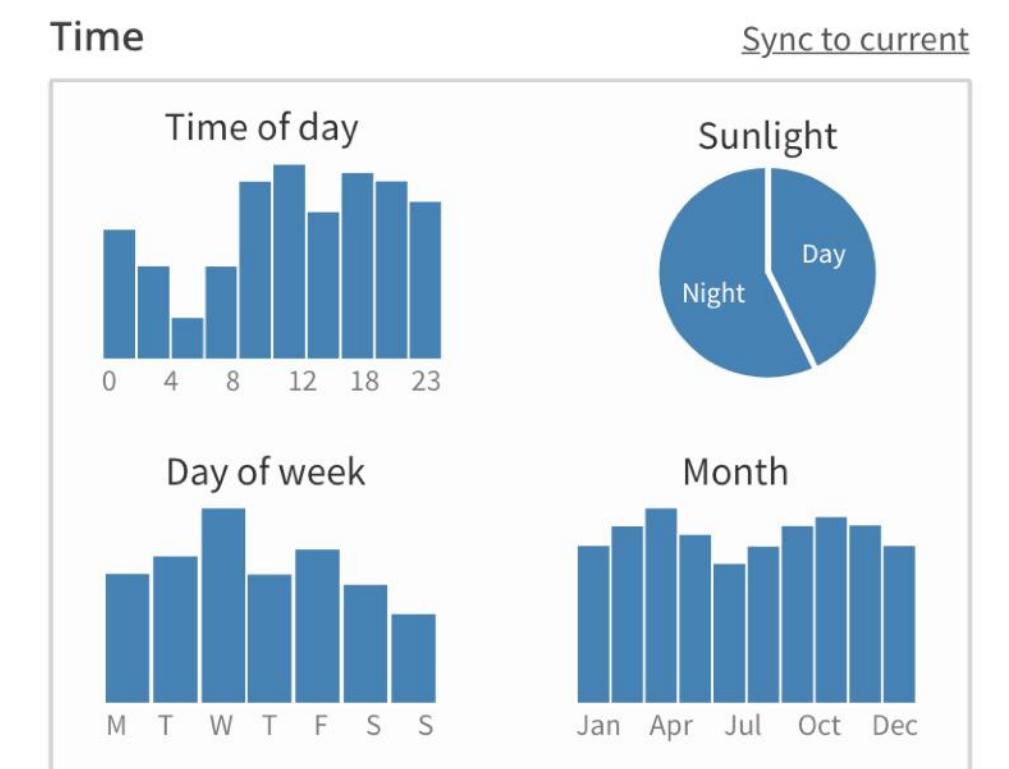
expected activity, parameterized

# INTEREST

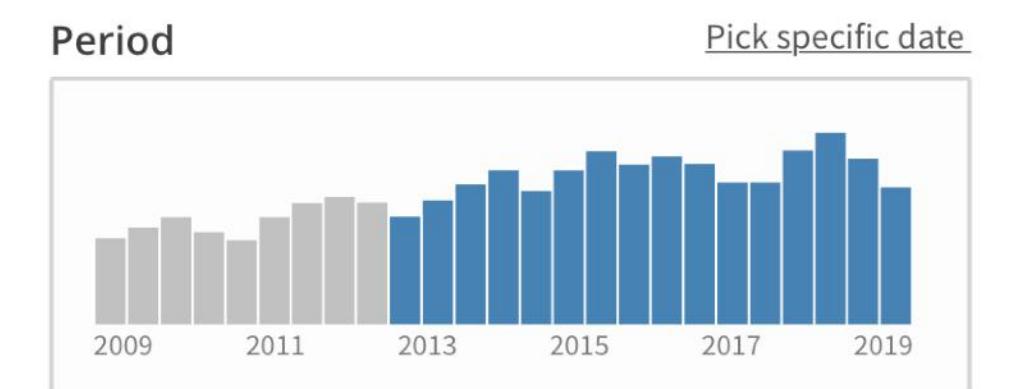
Place →



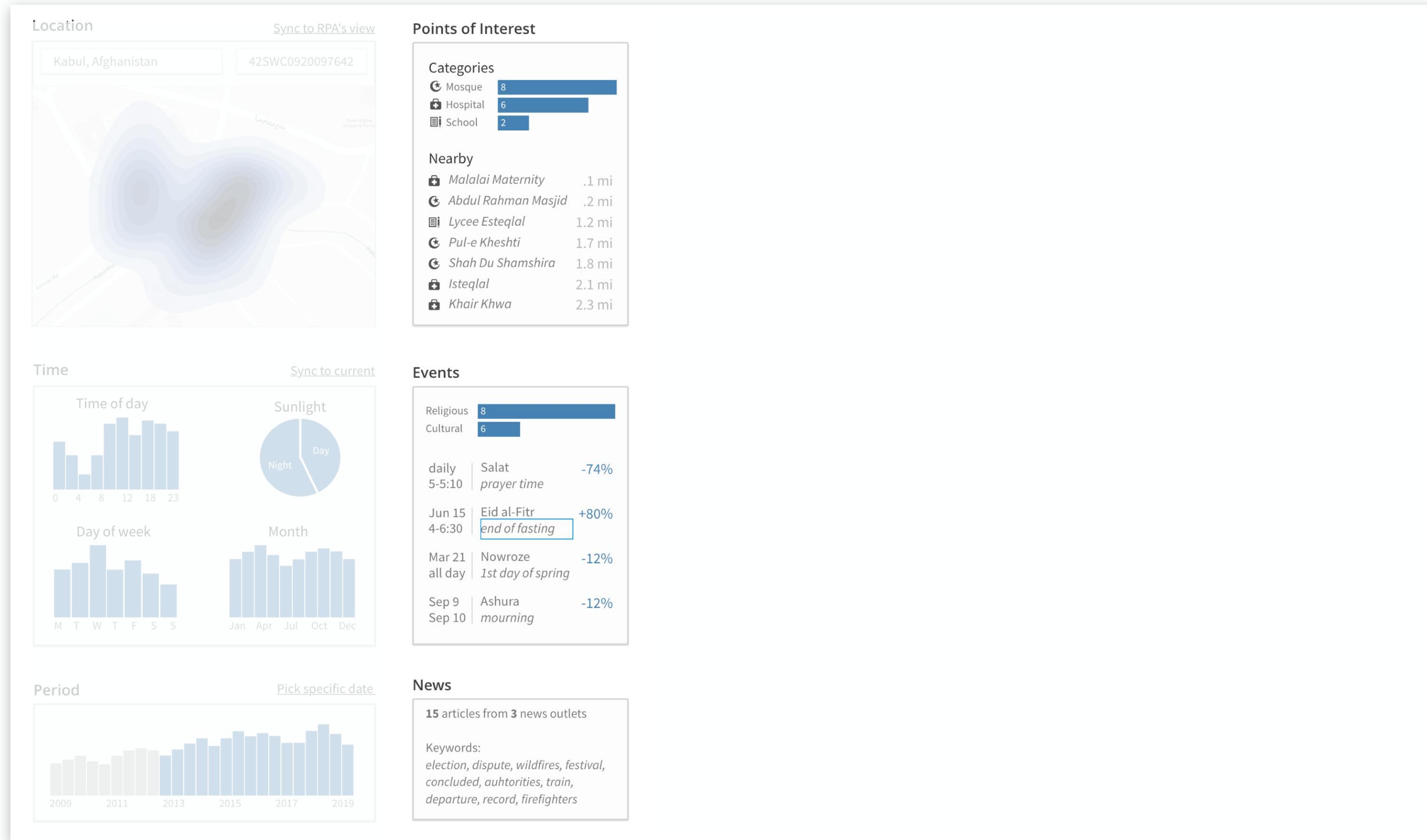
Time →



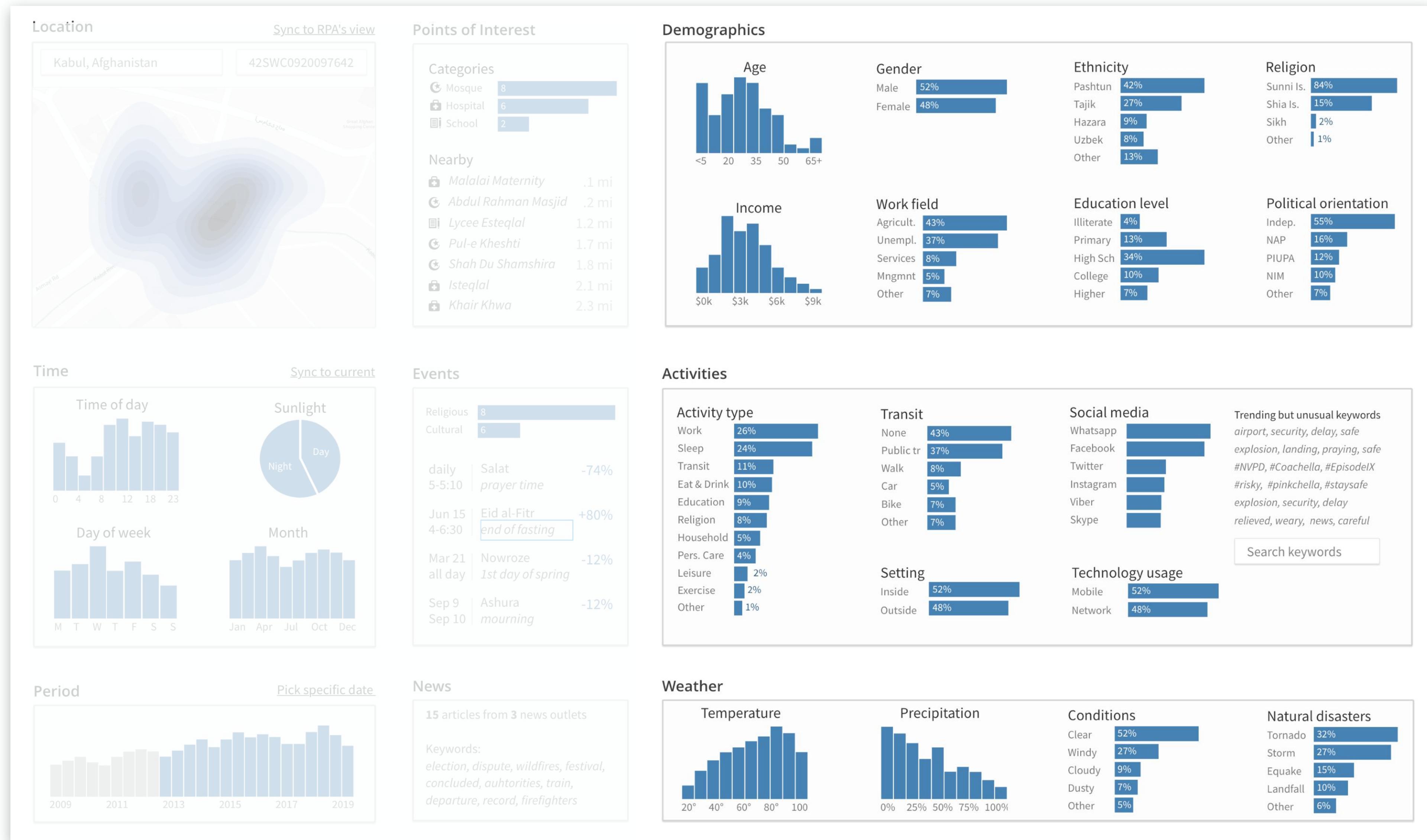
Recency →



# CERTAIN



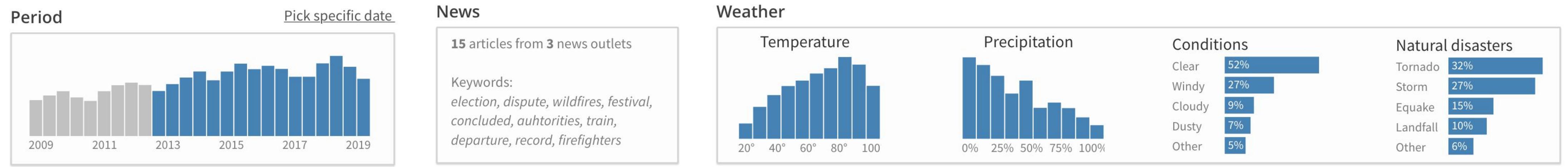
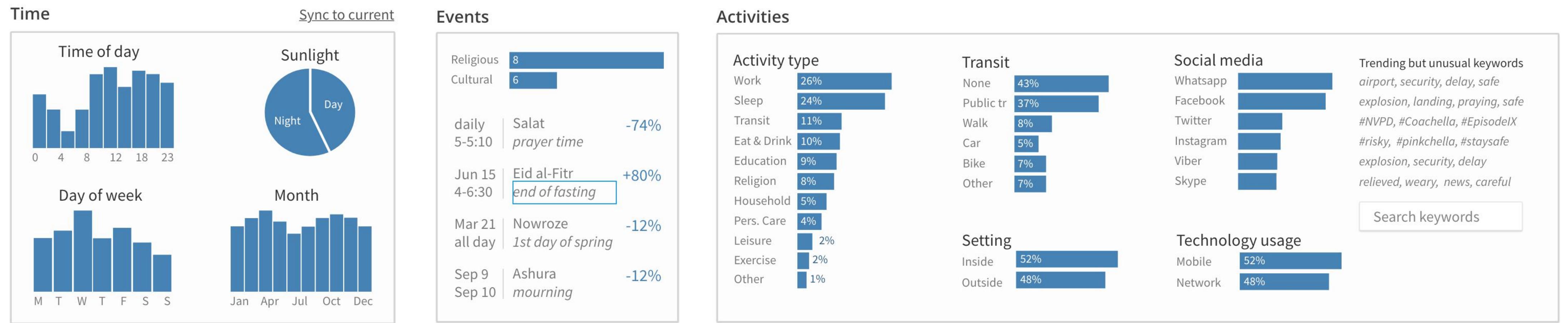
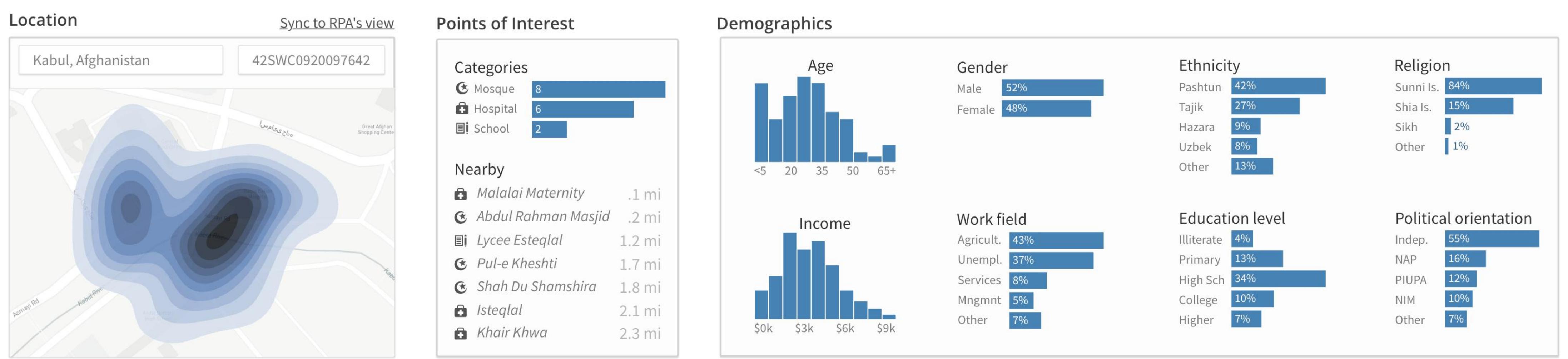
# DETAILS

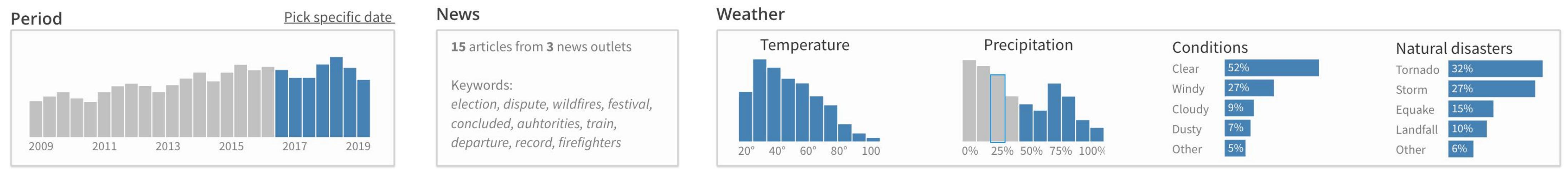
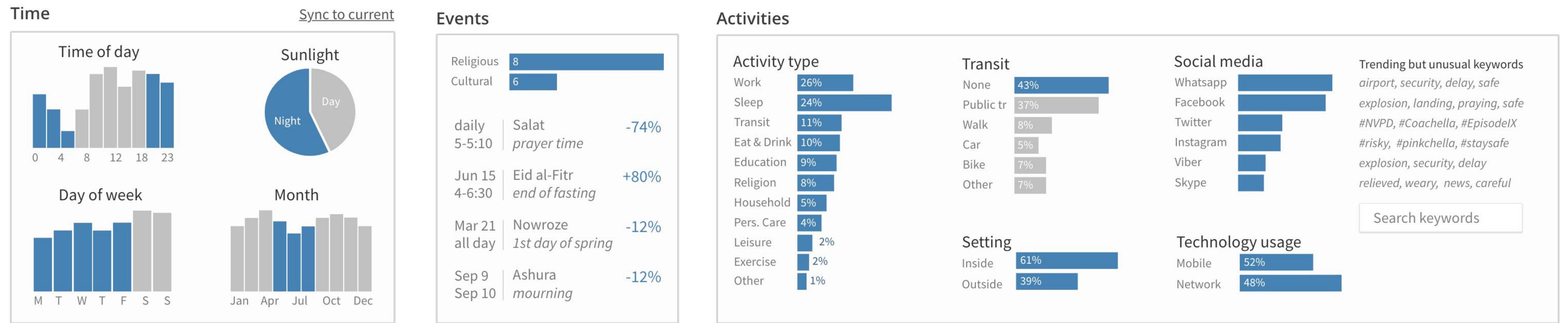
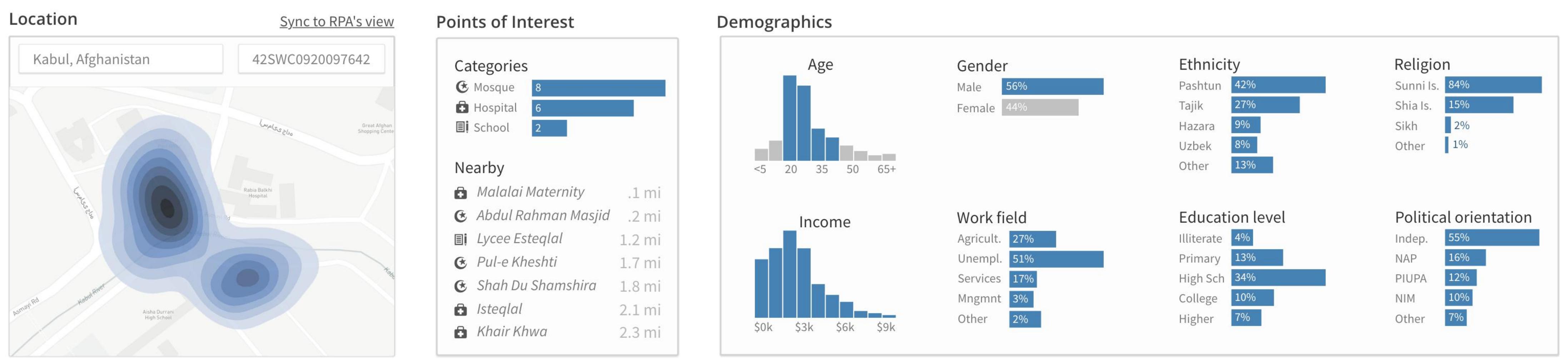


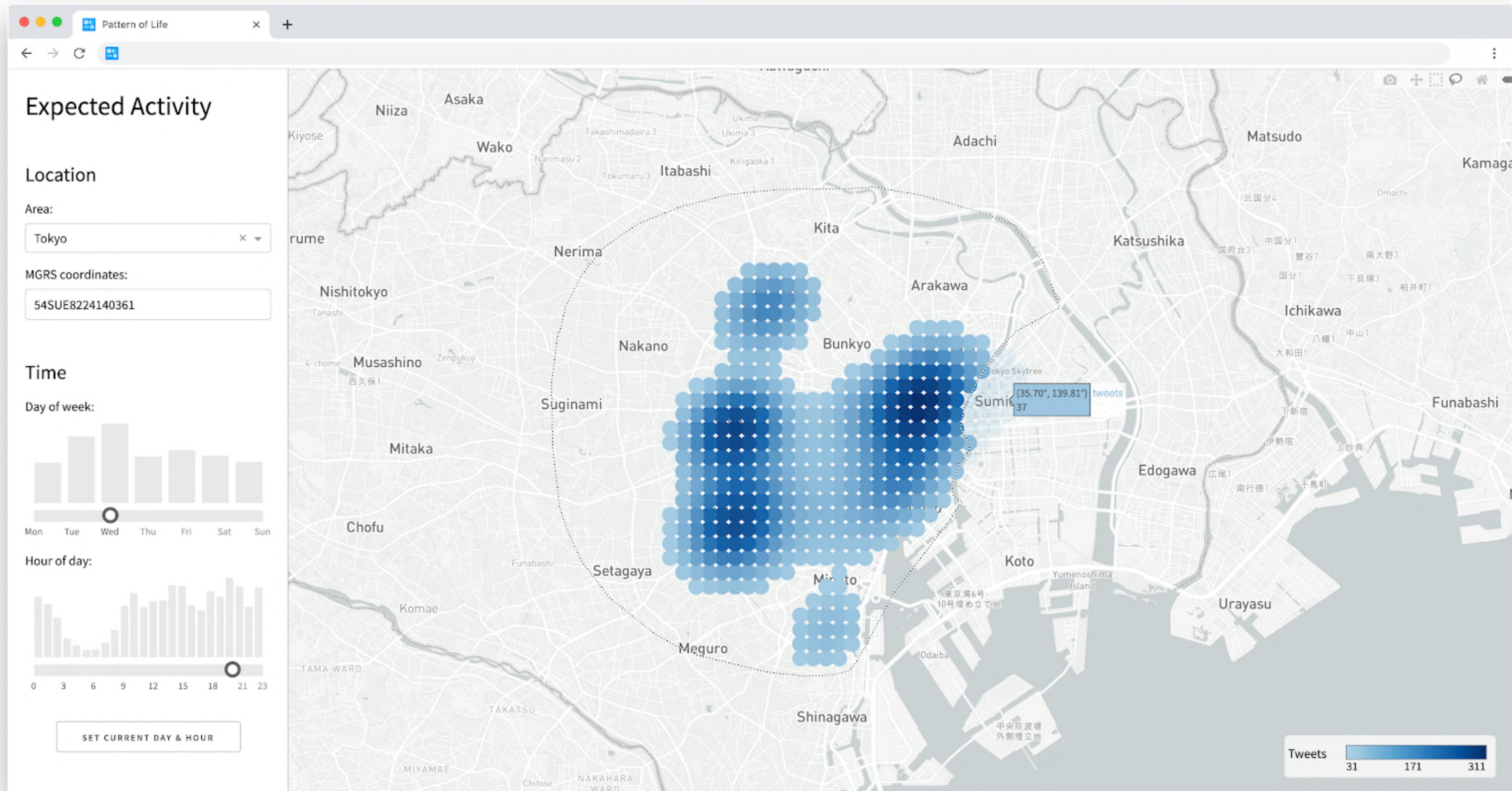
← Who

← What

← Nature









Age

Gender

Ethnicity

Religion

Income

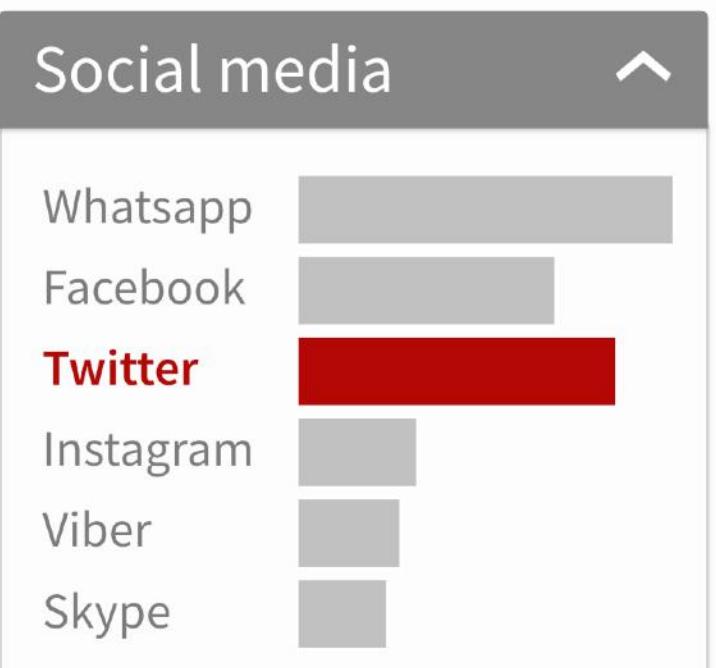
Activity type

Transit

Setting

Social media

Tech usage





would love this

it's powerful

it's what I need

this is incredible

would cut time

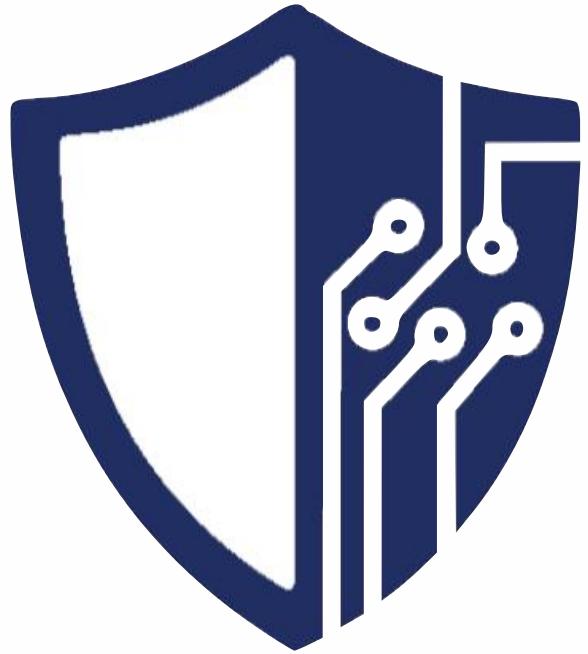
very useful

can't wait to use it

great job

easy to use

# Next steps:



Incubator



Integration



Present



Dual use

Thank you!

