



ATM – Weather Integration

“Pioneering the Frontier”

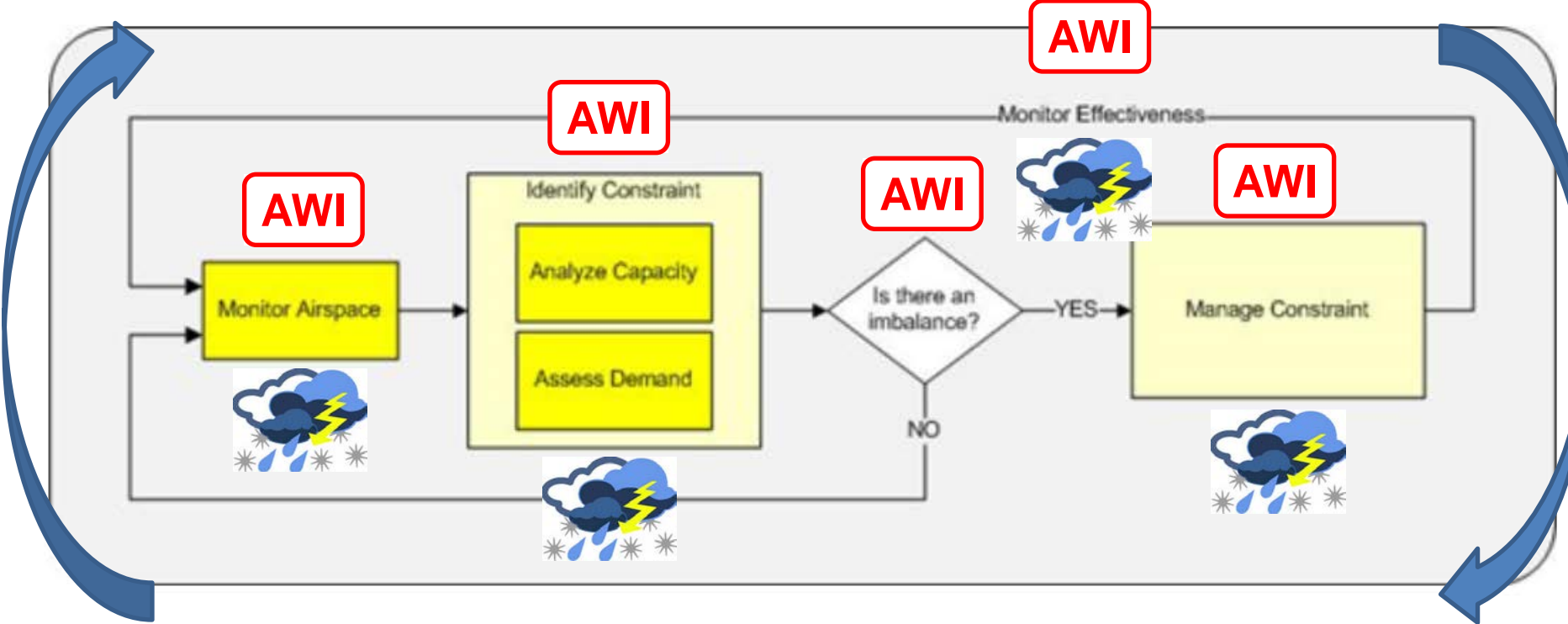
Mike Robinson
AvMet Applications, Inc

Friends and Partners in Aviation Weather
Summer Meeting 2015 – Washington D.C.

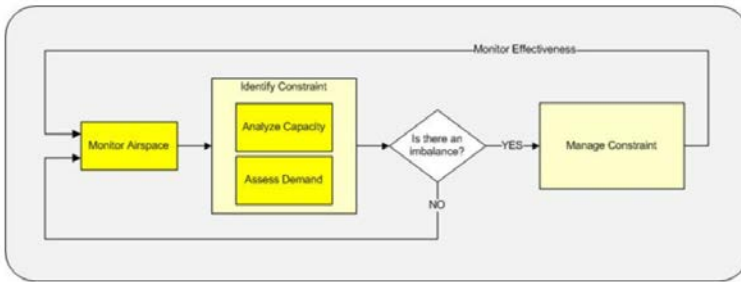


AvMet Applications, Inc.
1800 Alexander Bell Dr., Ste. 130
Reston, VA 20191

Where is AWI Needed?



What is AWI without AWI?



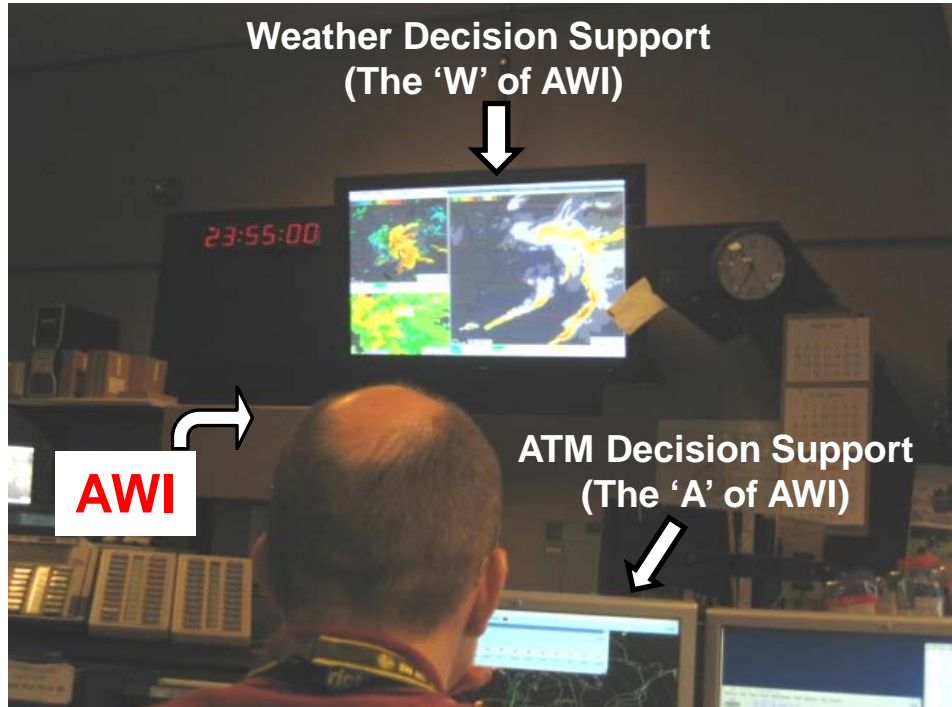
AWI exists as mental-models in the minds of air traffic managers (TM)

Aided by myriad of Weather and ATM decision support

- Including CWSU / NAM meteorologists ('W'-side) and collaboration among inter/intra- facility traffic management colleagues ('A'-side)

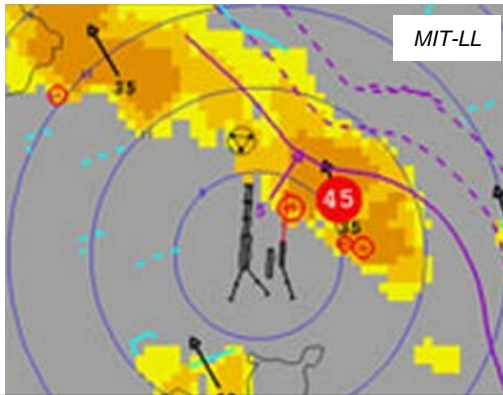
With this AWI:

- Effectiveness in execution varies
- Parts or ALL of TFM process at mercy of how fast TM can process and keep up
- Not a knock, mental-model no match for multi-faceted, 4-D complexity of WX-TFM event



Early Explorations Further Away From Homestead.... (some examples)

Integrated Terminal Weather System (ITWS)



Still Weather – but Relevant Aviation Weather that Ops Significantly Cares About

Route Availability Planning Tool (RAPT)

RAPT		CIWS							FAA	Help
Forecast:	Show	Show Precip	Show Echo Top							
Route	Trend	PIG							Update: 1335	
EMBEK_SALEM	==		49 NEAR	49 NEAR	47 NEAR	46 NEAR	45 NEAR	44 NEAR	47 NEAR	
DUFEE_JRU	==		43 NEAR	43 NEAR	41 NEAR	41 NEAR	40 NEAR	40 NEAR	39 NEAR	
MOBILE_CXR	==		43 NEAR	43 NEAR	42 NEAR	41 NEAR	41 NEAR	41 NEAR	40 NEAR	
MOBILE_BJB	==		42 NEAR	42 NEAR	42 NEAR	41 NEAR	41 NEAR	41 NEAR	40 NEAR	
MOBILE_AIR	==		42 NEAR	42 NEAR	42 NEAR	41 NEAR	41 NEAR	41 NEAR	40 NEAR	
LEAKE_GJJ_CRL	==		40 NEAR	40 NEAR	42 NEAR	40 NEAR	41 NEAR	41 NEAR	41 CNO	
LEAKE_GJJ_CERBS	==		50 NEAR	45 NEAR	51 NEAR	50 NEAR	51 NEAR	51 NEAR	51 CNO	
ACT10_STL	==								51 NEAR	
BNCEN_FAM	▲									
BNCEN_EHR	▲									
CESKY_PXV	▲		39 C90	34 C90						
DENNY_DONVE	▲		36 C90	35 C90						
DENNY_BURZE	▲		36 C90	36 C90						
ERAND_IJU	▲		36 C90	39 C90	34 C90					
ERAND_FLH	▲		36 C90	39 C90	34 C90					
PLL_RCU	==	50								
PLL_FDB	==	50								
EDU_I10	==	50								
EDU_R60	==	50								
NCV_LJRN										
NCV_I18										
NCV_IRK										
BNE_OBI									CNO	
BNE_GEP									CNO	
BNE_DLH									CNO	
PETTY_TVC									CNO	
PETTY_RBP									CNO	
PETTY_BKG									CNO	

Now Weather “Translation” for TFM – When & where I cannot ignore weather given specific ATM operation

ITWS Integration for Safety Decision Support is Mature

ITWS guidance for ATM Efficiency decisions remains “wild-west” data among all other info for TM’s mental model

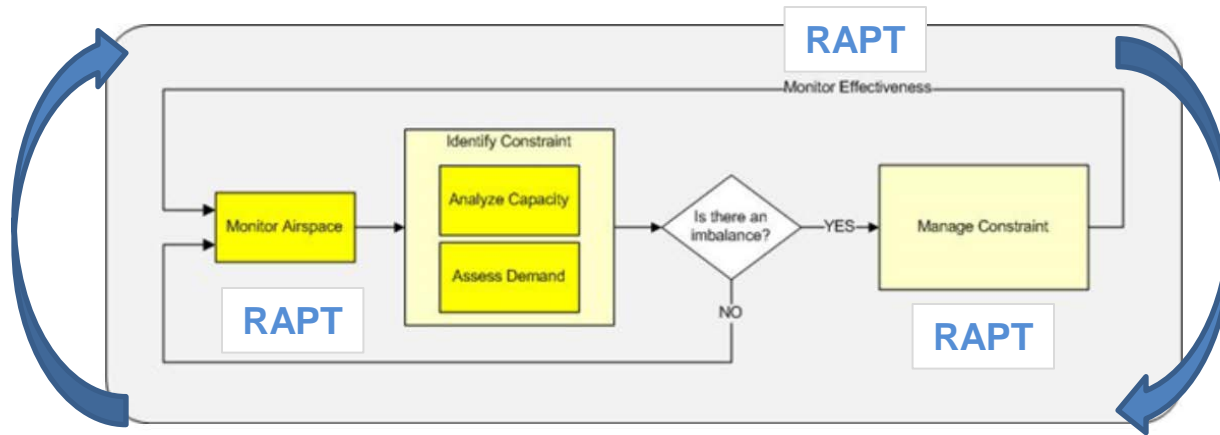
RAPT translated CIWS forecasts into statements of departure route availability for near-term airspace constraint awareness

Takes 4-D mental calculation for when key airspace will or will not be significantly affected by weather

However, not ‘full’ AWI, as it stops short of defining and recommending TFM solution(s) for route impact management



Even Getting This Far Was (Is) a Challenge.....



Cannot under-estimate the human factors challenges

- Traffic managers have been navigating the TFM process and WX-management decision process a specific way for a long time
- A significant challenge to modify current mental-models and indoctrinate new guidance, new way of problem-solving, etc; Challenges grow when process/paradigm-shifts for TFM required

Definition of TFM “success” ill-defined, not readily-tracked, and varies among decision-makers....as do the decision risks (heightens sensitivity to “burn factor”?)

RAPT		CWS					
Forecast:	Show	Show Precip	Show Echo Top				Help
Route	Trend	PIG					Update: 1525
LEAKE_SALEM	==		41 NEAR	44 NEAR	47 NEAR	49 NEAR	47 NEAR
BUFFE_BJA	==		41 NEAR	44 NEAR	47 NEAR	49 NEAR	47 NEAR
MOBLE_COK	==		41 NEAR	44 NEAR	47 NEAR	49 NEAR	47 NEAR
MOBLE_BJB	==		41 NEAR	44 NEAR	47 NEAR	49 NEAR	47 NEAR
MOBLE_RIR	==		41 NEAR	44 NEAR	47 NEAR	49 NEAR	47 NEAR
LEAKE_GJJ_CRL	==		41 NEAR	44 NEAR	47 NEAR	49 NEAR	47 NEAR
LEAKE_GJJ_CERBS	==		41 NEAR	44 NEAR	47 NEAR	49 NEAR	47 NEAR
ACFD_STL	==						33 NEAR
BRCKN_FOM	▲						
BRCKN_COK	▲						
CHICK_PFF	▲		39 CNO	34 CNO			
BENNY_BENNE	▲		36 CNO	35 CNO			
BENNY_BENNE	▲		36 CNO	36 CNO			
LEAKB_L110	▲		36 CNO	39 CNO	34 CNO		
LEAKB_FLN	▲		36 CNO	39 CNO	34 CNO		
PLL_MCU	==		50				
PLL_FOB	==		50				
LOU_L10	==		50				
LOU_MGO	==		50				
NOV_LBN	==		50				
NOV_L18	==		50				
NOV_IBK	==		50				
NOV_OBI	▼			46 NEAR	45 NEAR	42 NEAR	39 NEAR
NOV_COP	▼			46 NEAR	42 NEAR	43 NEAR	39 CNO
NOV_BJH	==						44 NEAR
PETTY_LVC	==						43 NEAR
PETTY_ASP	▲		33 NEAR	33 NEAR			
PETTY_HKO	==		47 NEAR	46 CNO	45 NEAR	44 NEAR	45 NEAR
Departure Time:			1535	1540	1545	1550	1555
							1600
							1605

GPSM Stakes A Claim in the AWI Frontier.....

SFO Ground Delay Program (GDP) Program Selection Model (GPSM) uses probabilistic forecasts for SFO marine-stratus clearing to provide recommendations for GDP parameters for this airport

- Thus, extends beyond weather translation and more firmly into realm of AWI by outputting explicit TMI response options to manage specific ATM constraints

Mosaic ATM

- Trailblazing effort in the AWI arena – which shined a light brighter on AWI challenges and from which important lessons-learned were gleaned
- Chris Provan (Mosaic ATM) to now discuss GPSM and AWI in more details....