EAD Portfolio Analysis: Dependency and Diversification in the NGATS Portfolio

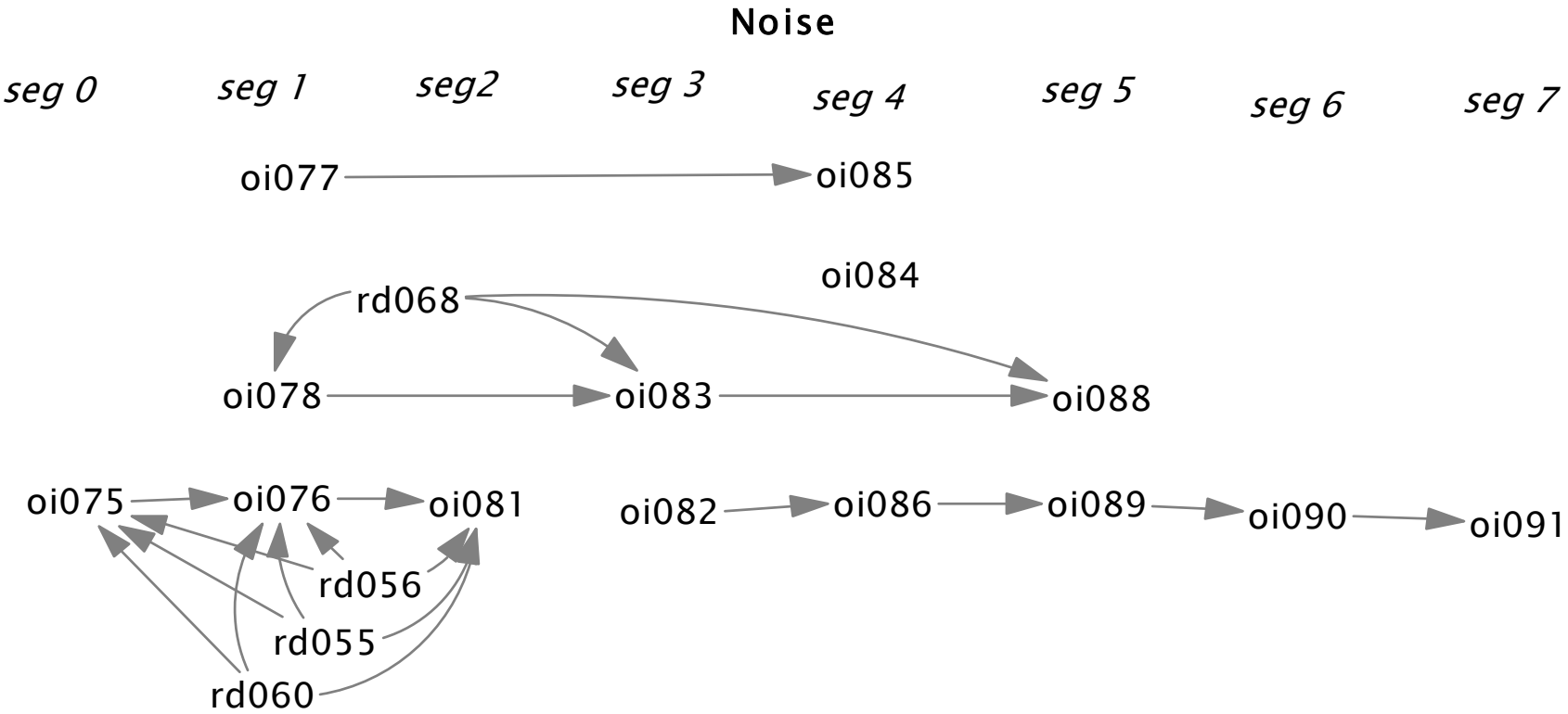
Dan Goldner (Ventana Systems, Inc.)
Jack Fearnsides (MJF Strategies)
18 July 2006

Attributes of an OI

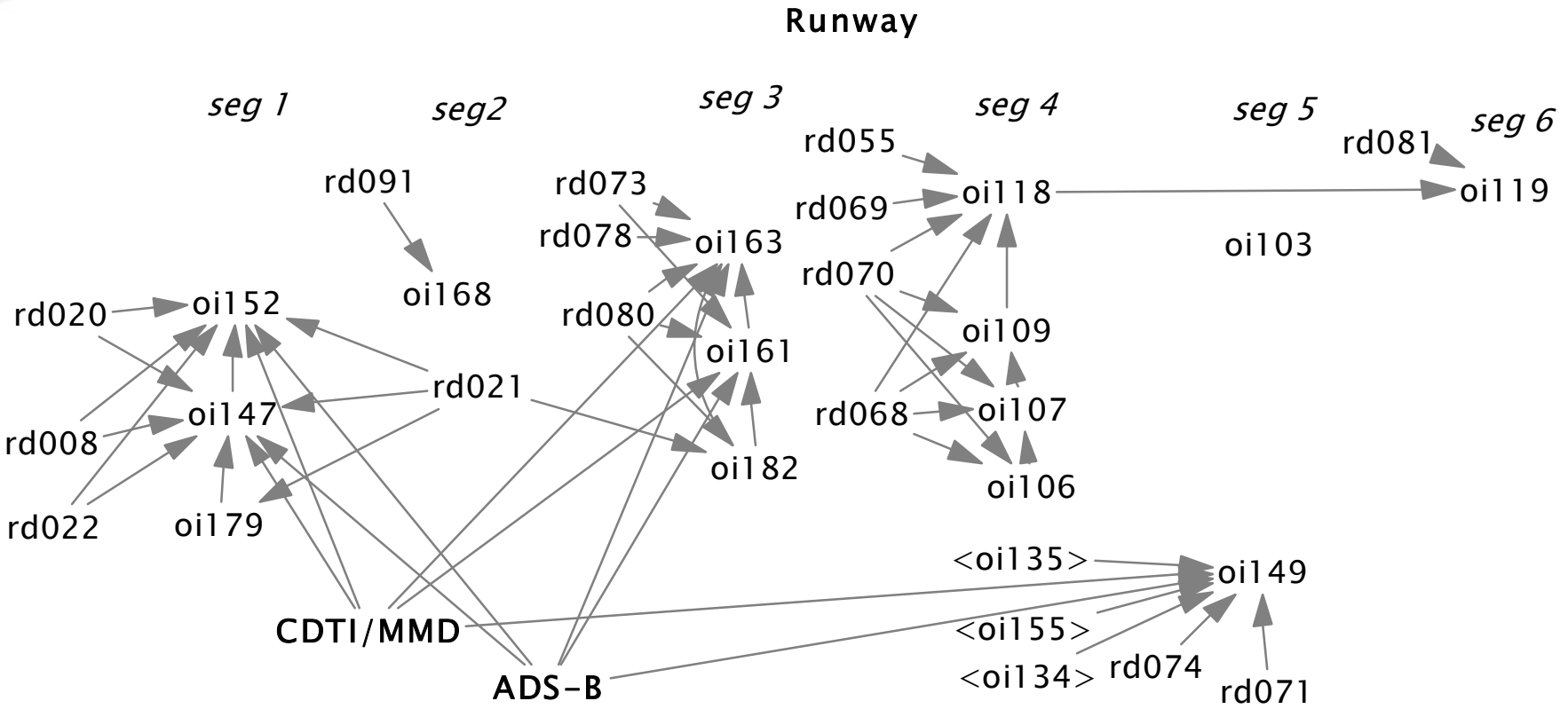
1. What constraint(s) does the OI address?
   We labeled OIs as having an effect on one or more of the following considerations: noise, emissions, runway capacity, terminal airspace capacity, enroute capacity, oceanic capacity, bad-weather capacity, landside capacity, airport surface capacity, certification capacity, security, safety, cost
2. What R&D activities are required for the OI to be implemented?
   PMD provided us with a list from Ed Koenke et al. of 97 R&D topics distilled out of the Agency Budget Guidance and associated with OIs from an old roadmap. Starting from Koenke's mapping, JF labeled each OI with one or more of the 97 R&D activities required to produce the OI.
3. Which of the other OIs are prerequisites to the OI?
   Based on the descriptions of each OI from the Roadmap, JF labeled each OI with any other OIs that seemed to be prerequisites.
4. What enabling systems or infrastructure are required?
   These were provided for many OIs in the Roadmap. For the remaining OIs, we assumed "none".

IMPORTANT NOTE: Our choices for each OI of constraints addressed, R&D tasks required, prerequisite OIs, and enabling infrastructure are our best estimate from the information provided, but we consider them to be PLACEHOLDERS pending a thorough review by the IPTs via PMD.

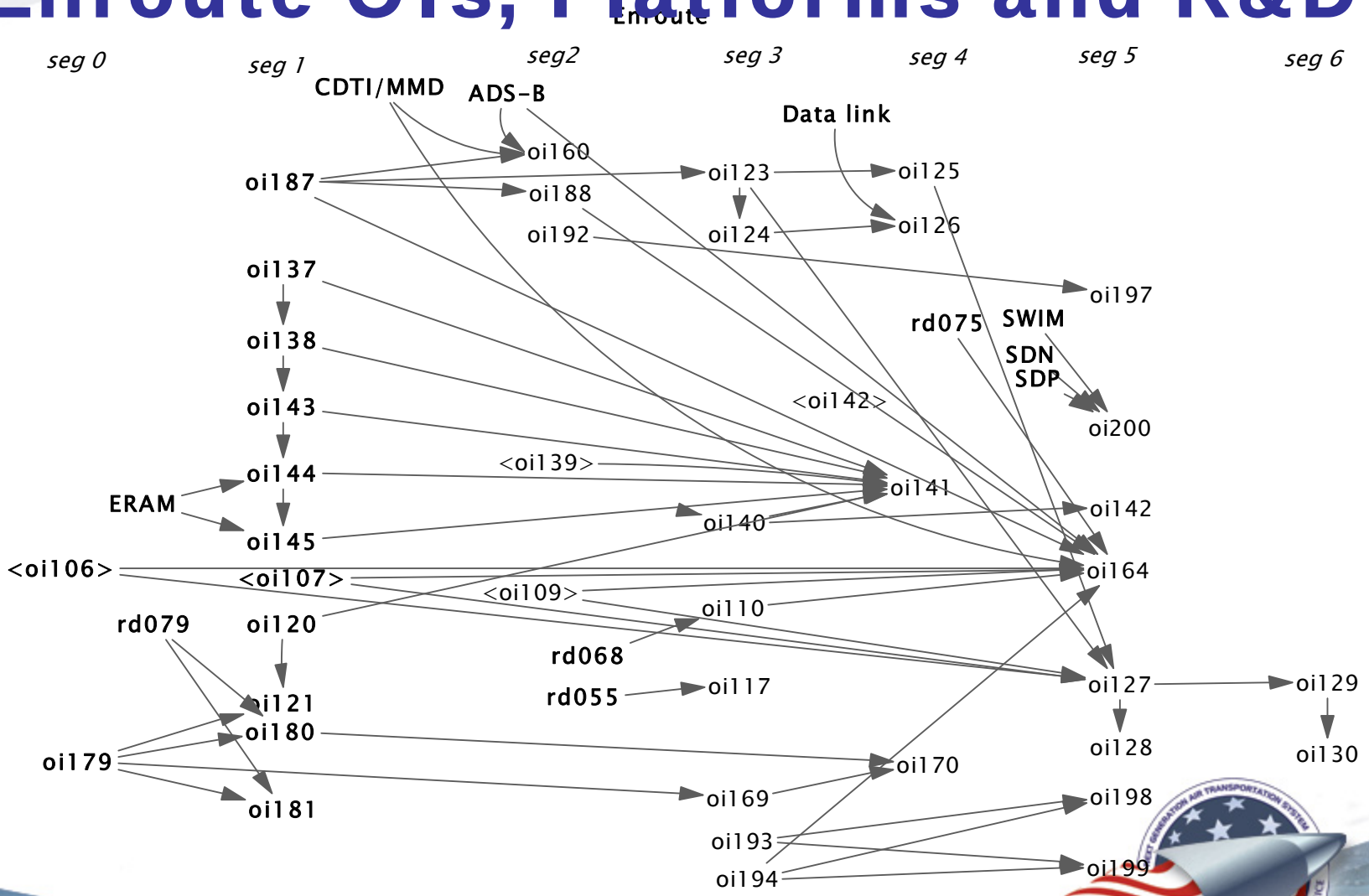
Noise OIs, R&D


Noise
seg 0
seg 1
seg2
seg 3
seg 4
seg 5
seg 6
seg 7
oi077
oi085
oi084
rd068
oi078
oi083
oi088
oi075
oi076
oi081
oi082
oi086
oi089
oi090
oi091
rd056
rd055
rd060

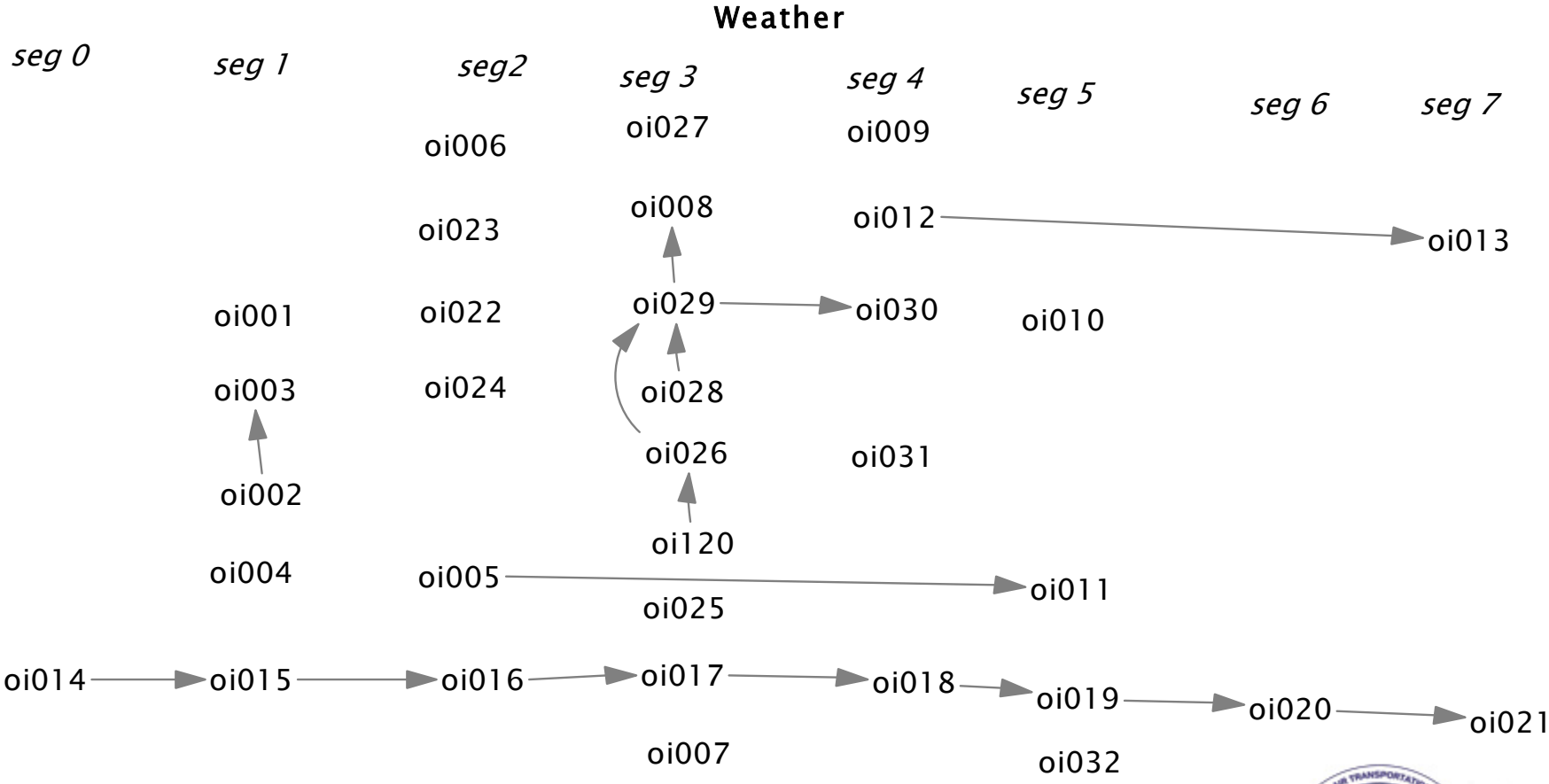
Runway OIs, Platforms, and R&D



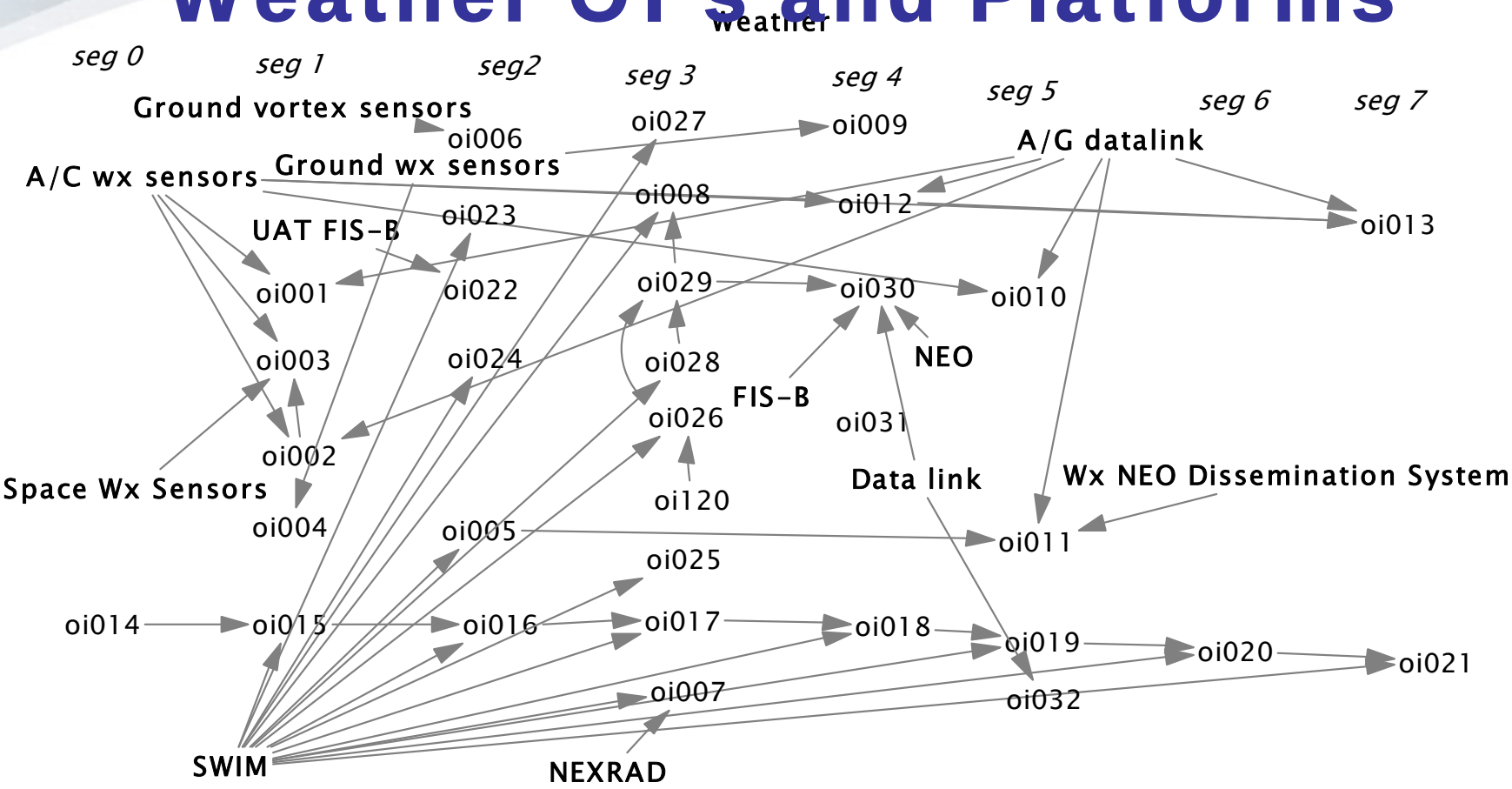
Enroute OIs, Platforms and R&D



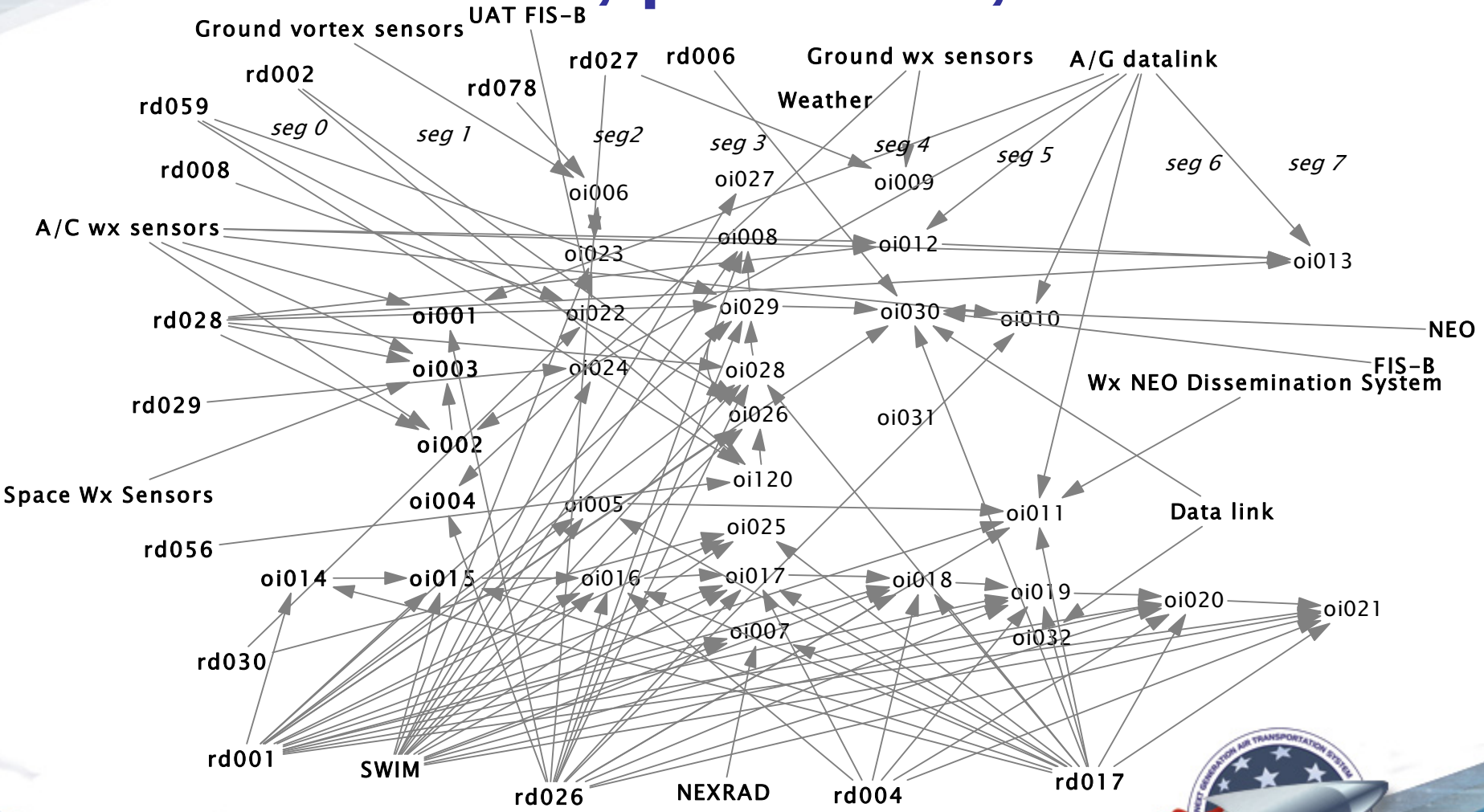
Weather OIs


Weather
seg 0
seg 1
seg2
seg 3
seg 4
seg 5
seg 6
seg 7
oi006
oi027
oi009
oi008
oi012
oi013
oi023
oi001
oi022
oi029
oi030
oi010
oi003
oi024
oi028
oi026
oi031
oi002
oi120
oi004
oi005
oi011
oi025
oi014
oi015
oi016
oi017
oi018
oi019
oi020
oi021
oi007
oi032

Weather OI's and Platforms

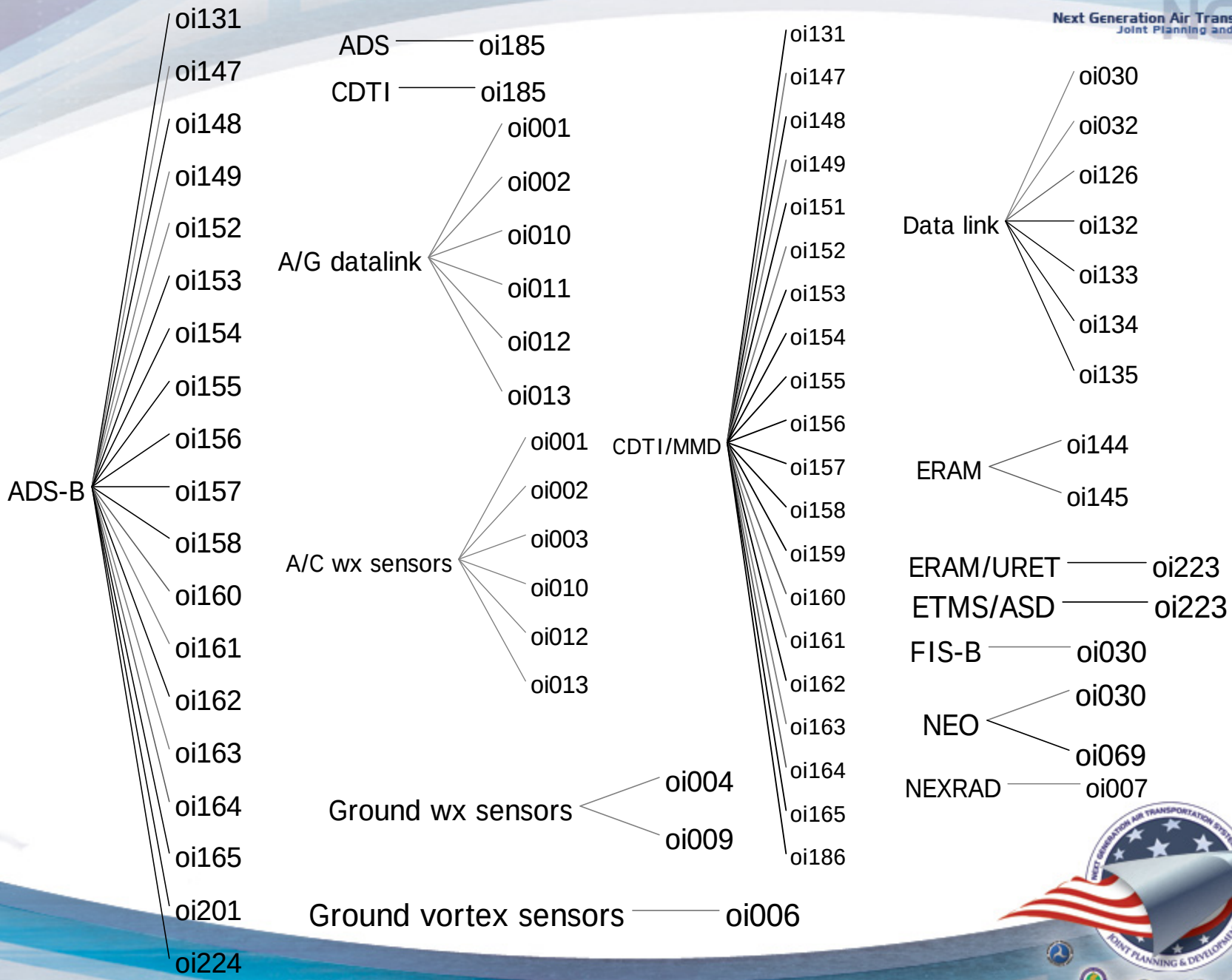


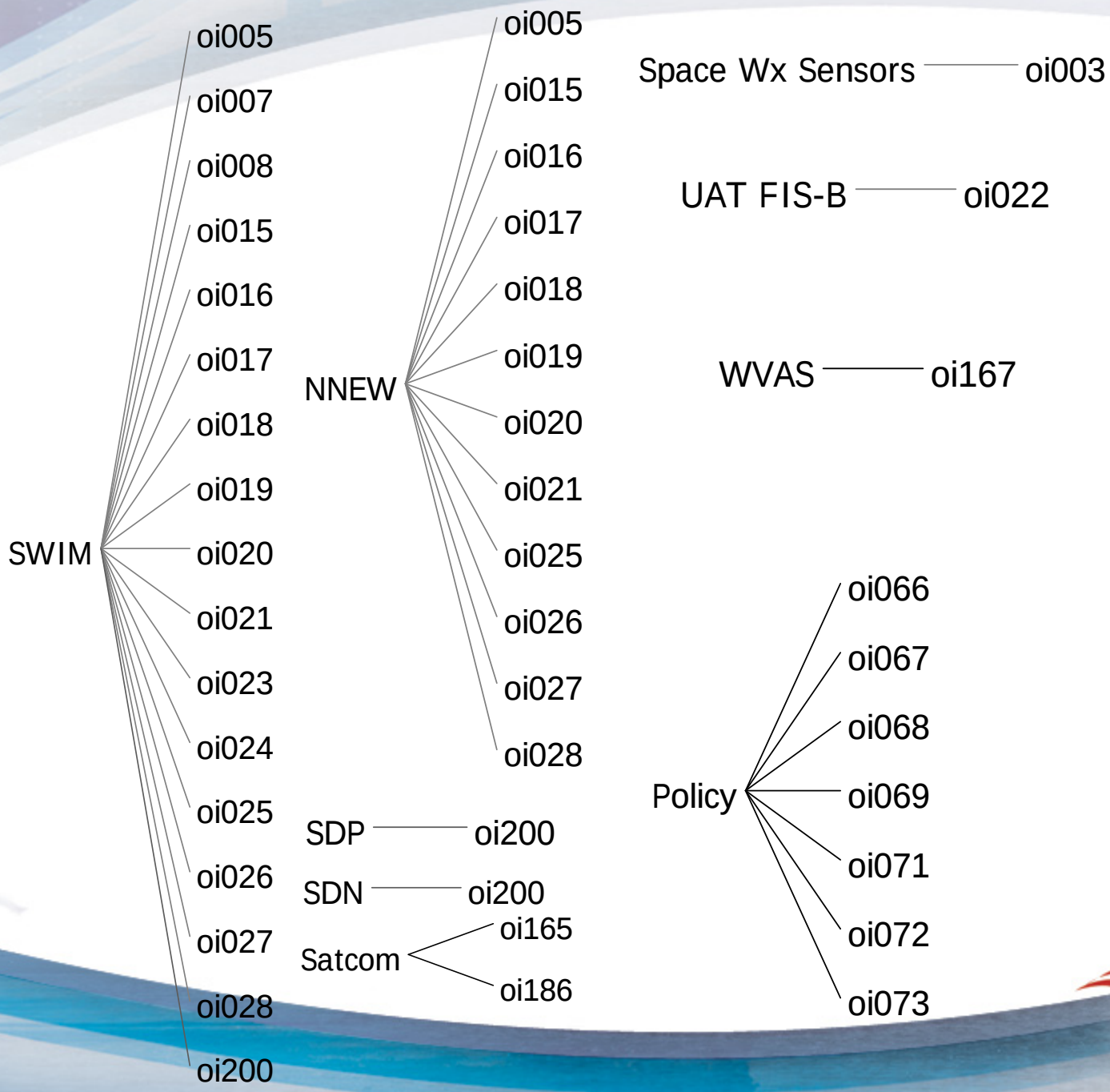
Weather OIs, platforms, and R&D



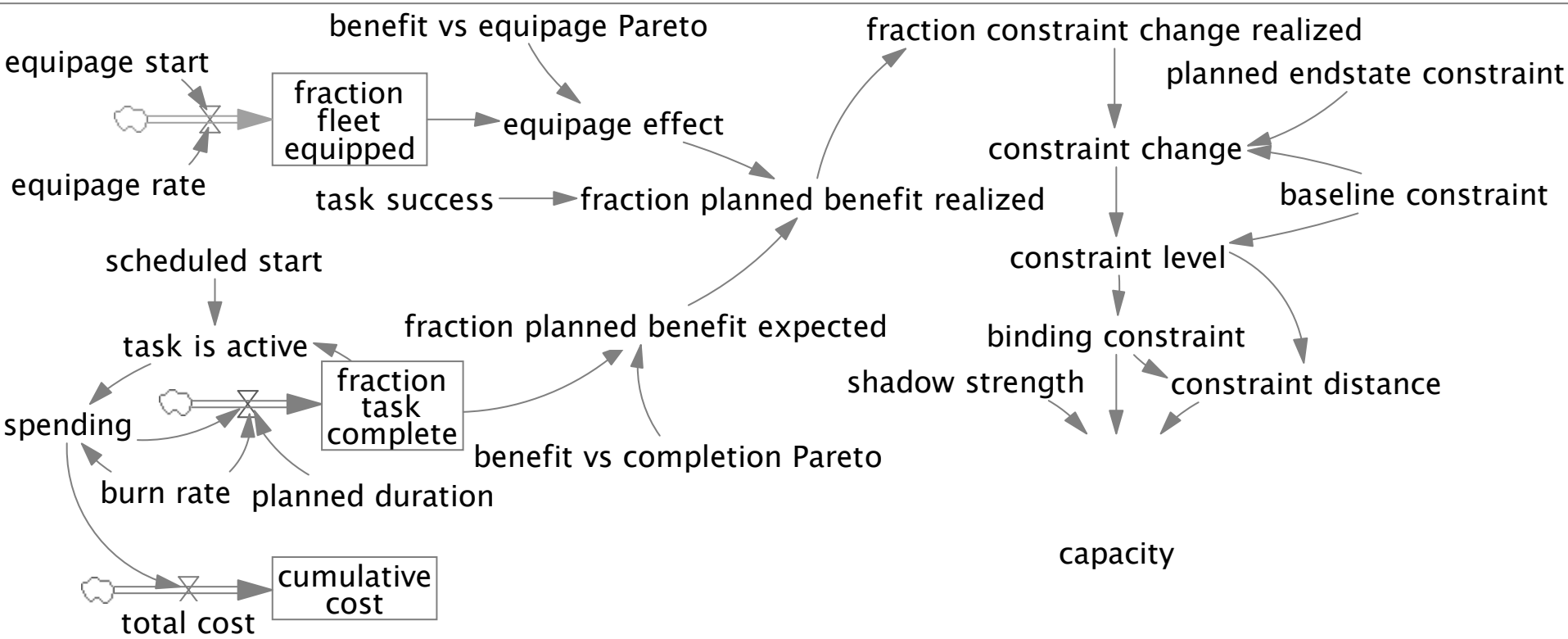
Similar structures (not shown) exist for:

- Terminal
- Landside (people, baggage, cargo)
- Surface Movement of Aircraft (taxiing etc)
- Oceanic
- Certification
- Security
- Safety


ADS-B
oi131
oi147
oi148
oi149
oi152
oi153
oi154
oi155
oi156
oi157
oi158
oi160
oi161
oi162
oi163
oi164
oi165
oi201
oi224
ADS
oi185
CDTI
oi185
A/G datalink
oi001
oi002
oi010
oi011
oi012
oi013
A/C wx sensors
oi001
oi002
oi003
oi010
oi012
oi013
Ground wx sensors
oi004
oi009
Ground vortex sensors
oi006
CDTI/MMD
oi131
oi147
oi148
oi149
oi151
oi152
oi153
oi154
oi155
oi156
oi157
oi158
oi159
oi160
oi161
oi162
oi163
oi164
oi165
oi186
Data link
oi030
oi032
oi126
oi132
oi133
oi134
oi135
ERAM
oi144
oi145
ERAM/URET
oi223
ETMS/ASD
oi223
FIS-B
oi030
NEO
oi030
oi069
NEXRAD
oi007

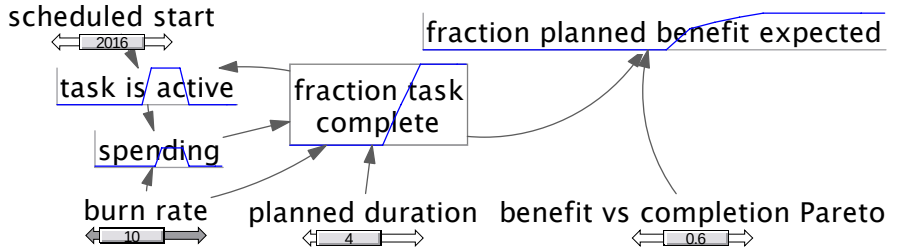

SWIM
oi005
oi007
oi008
oi015
oi016
oi017
oi018
oi019
oi020
oi021
oi023
oi024
oi025
oi026
oi027
oi028
oi200
NNEW
oi005
oi015
oi016
oi017
oi018
oi019
oi020
oi021
oi025
oi026
oi027
oi028
SDP
oi200
SDN
oi200
Satcom
oi165
oi186
Space Wx Sensors
oi003
UAT FIS-B
oi022
WVAS
oi167
Policy
oi066
oi067
oi068
oi069
oi071
oi072
oi073

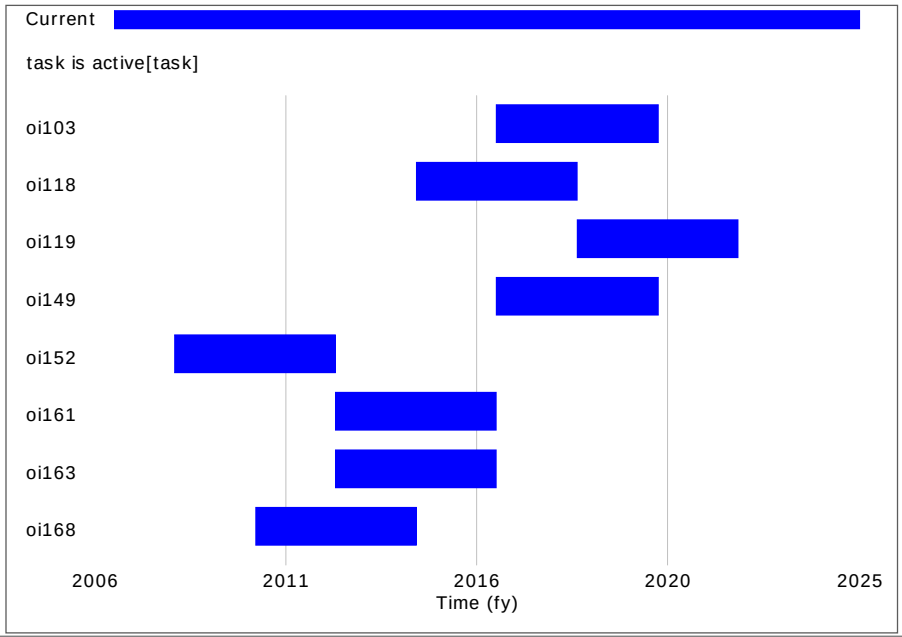
This model estimates capacity as a function of the % complete and the success of R&D, platform, and OI tasks and the % of the fleet equipped for each platform

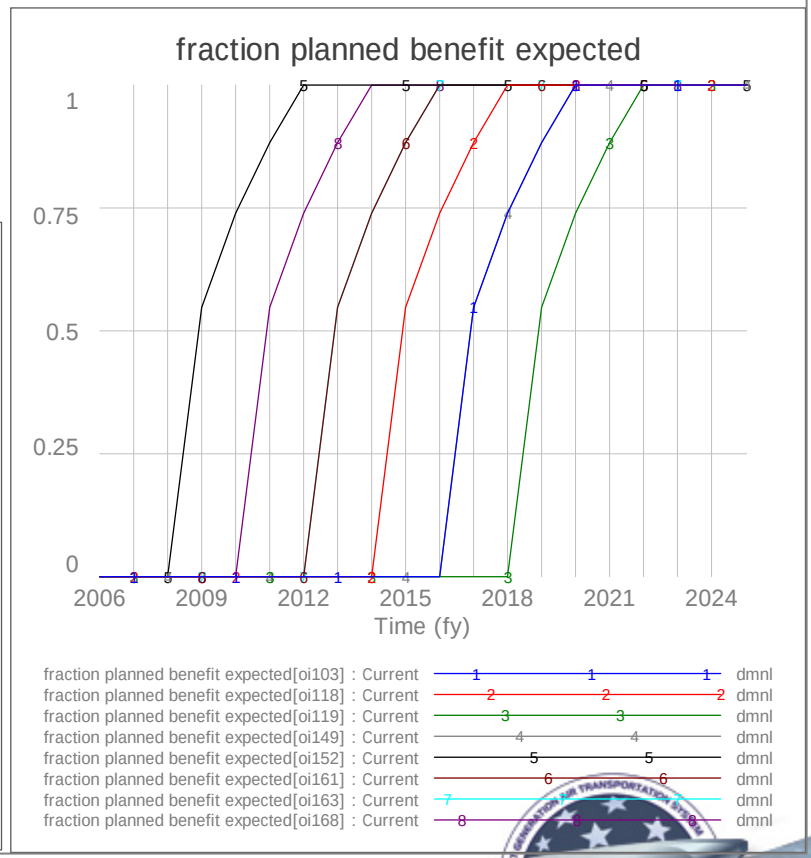


Copyright © 2006 Ventana Systems, Inc.

Task Completion

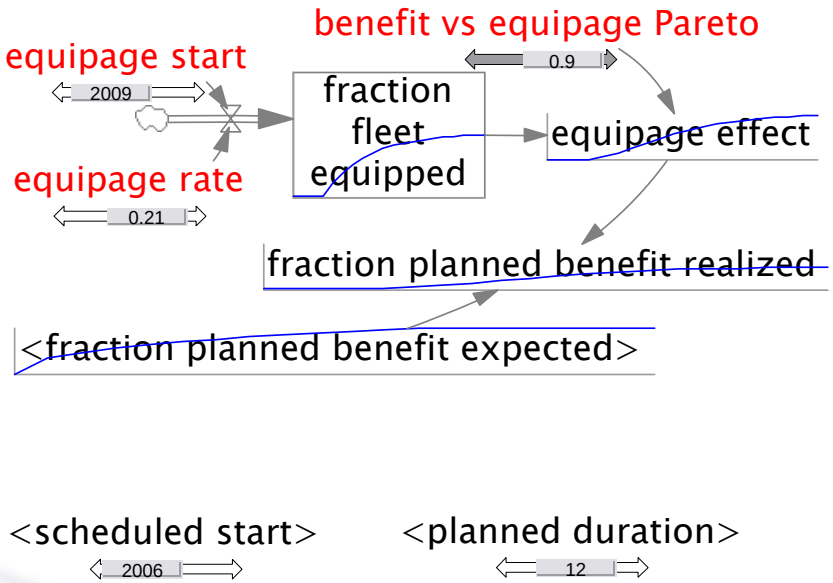


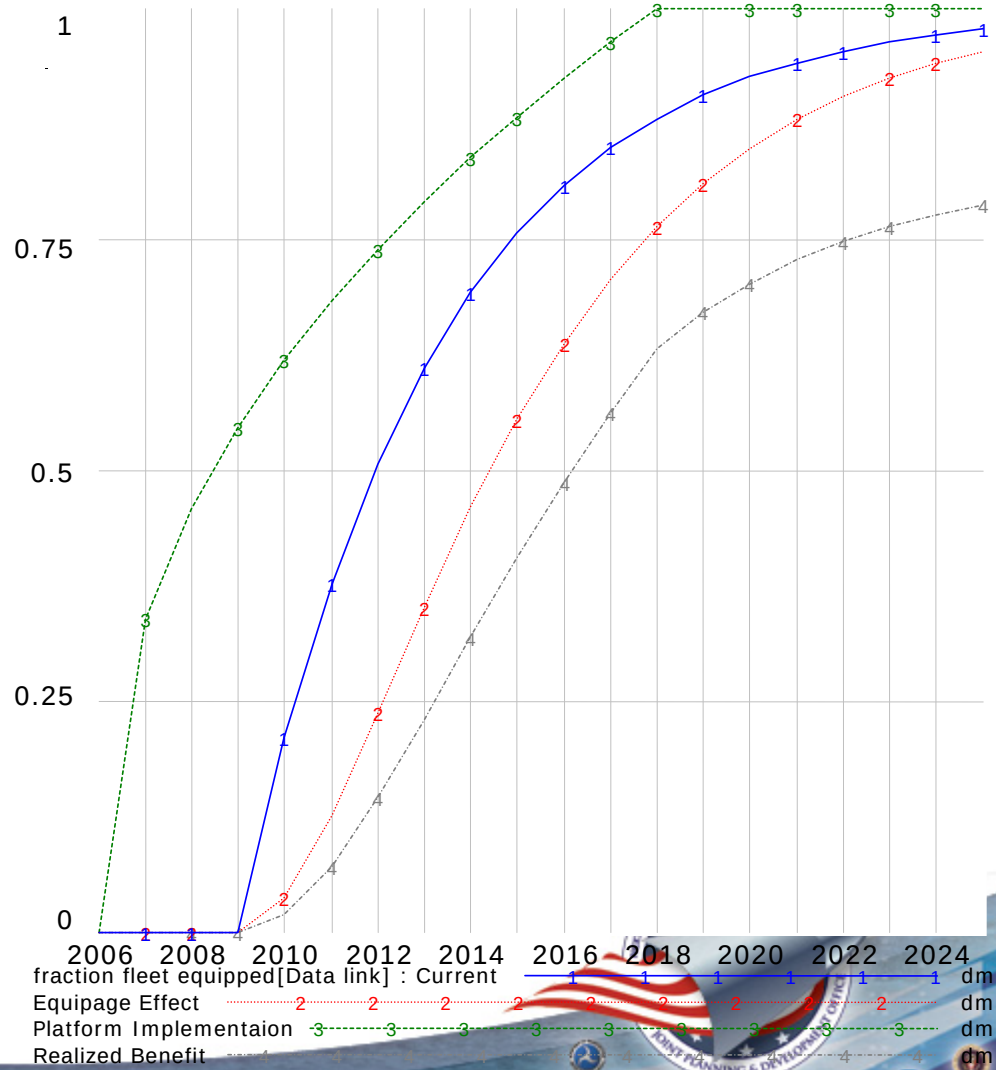




Copyright © 2006 Ventana Systems, Inc.

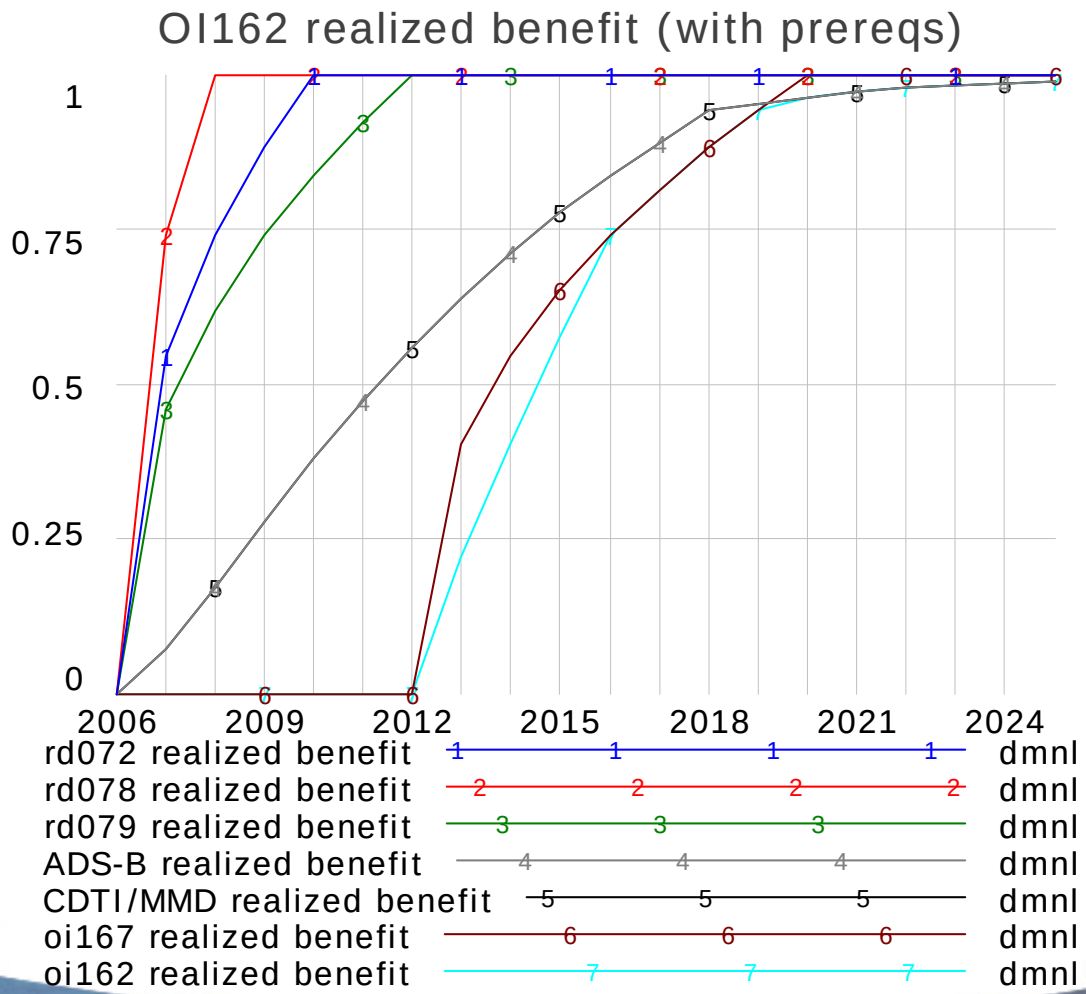
Equipage





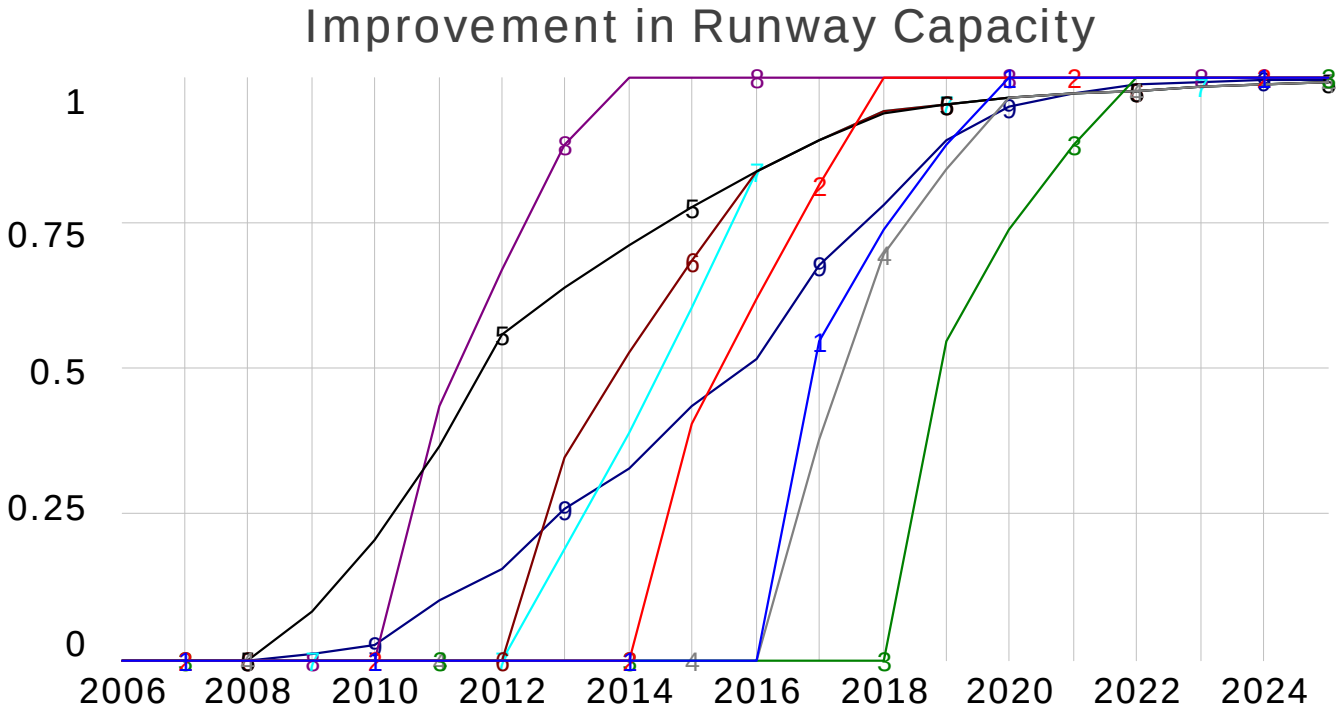
Copyright © 2006 Ventana Systems, Inc.

OI Effectiveness



Copyright © 2006 Ventana Systems, Inc.

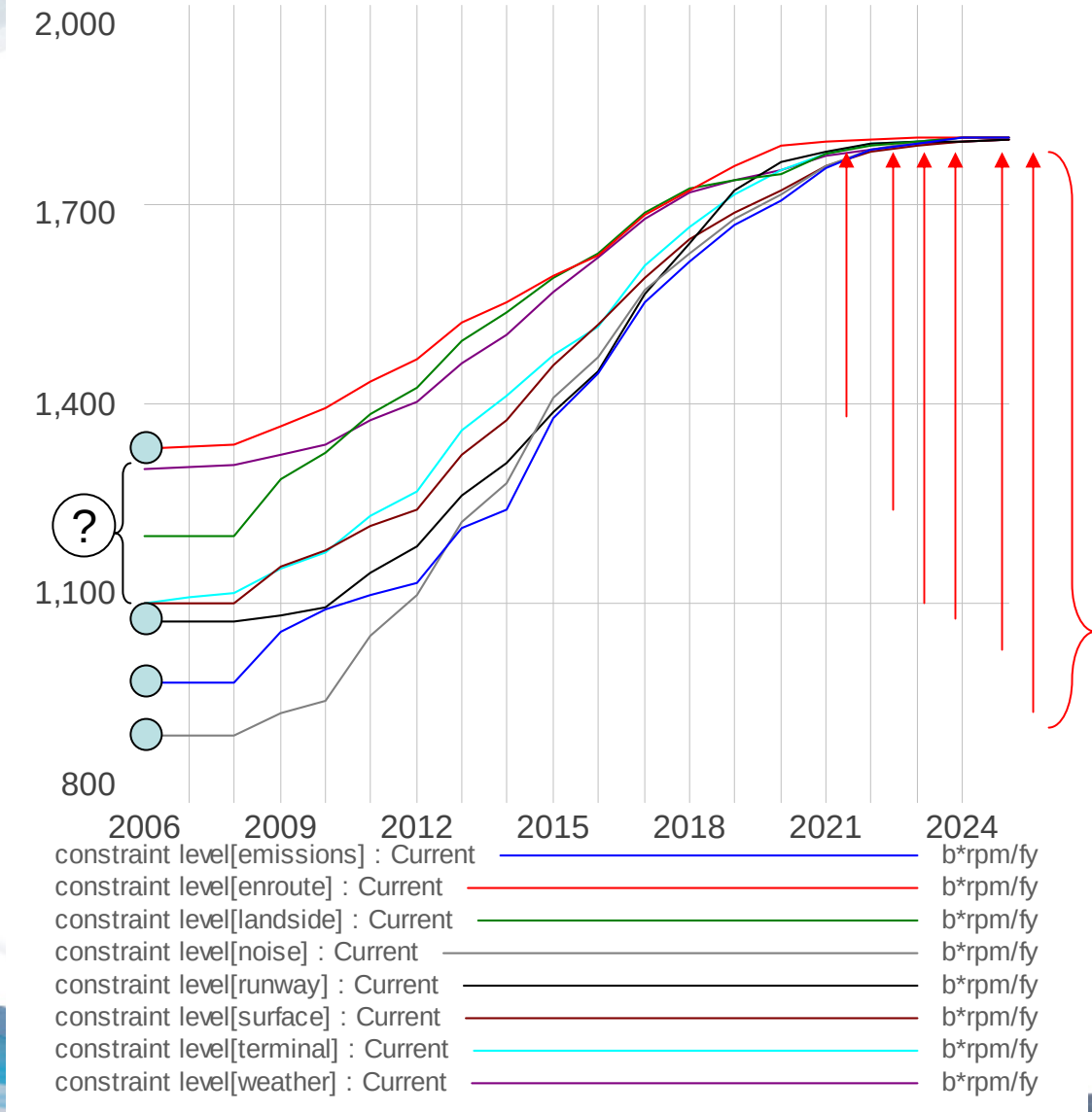
Realized Fraction of Potential Constraint Change



oi103 Realized	1	1	1	1	dmnl
oi118 Realized	2	2	2	2	dmnl
oi119 Realized	3	3	3	3	dmnl
oi149 Realized	4	4	4	4	dmnl
oi152 Realized	5	5	5	5	dmnl
oi161 Realized	6	6	6	6	dmnl
oi163 Realized	7	7	7	7	dmnl
oi168 Realized	8	8	8	8	dmnl
Overall Realized Improvement	9	9	9		dmnl

Copyright © 2006 Ventana Systems, Inc.

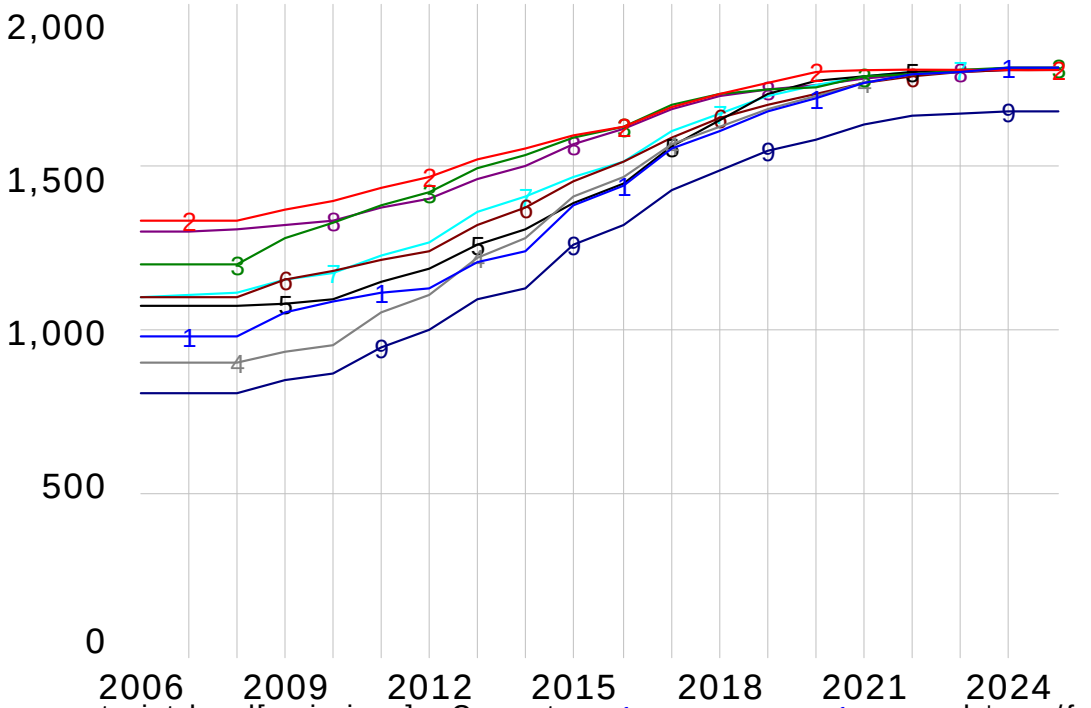
Magnitude of Potential Constraint Change



- starting value for noise, emissions, runway and enroute from Constraints Analysis 3/06
- ? starting value for other constraints unknown, TBD (constraints analysis)
- ? ending values unknown, TBD (portfolio analysis)

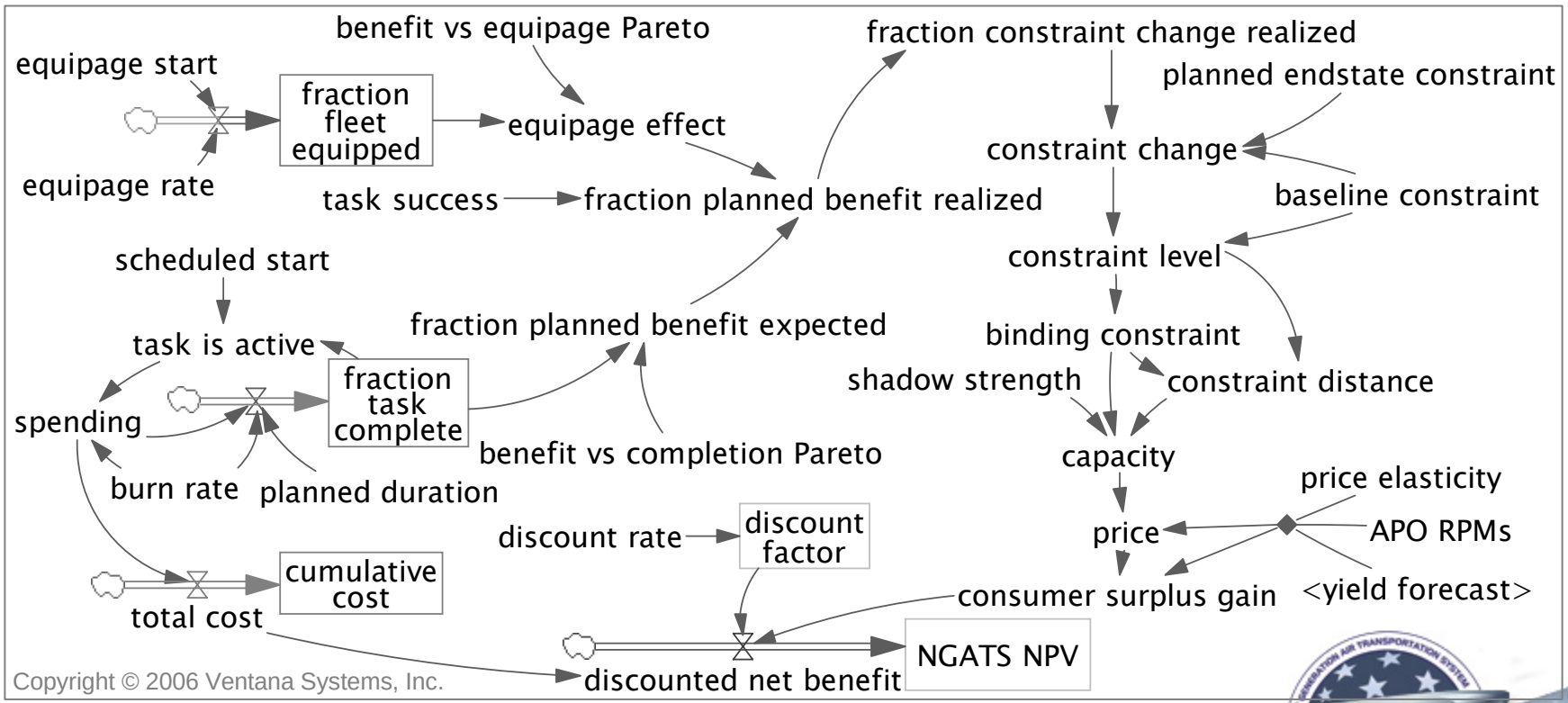
Copyright © 2006 Ventana Systems, Inc.

Overall Capacity

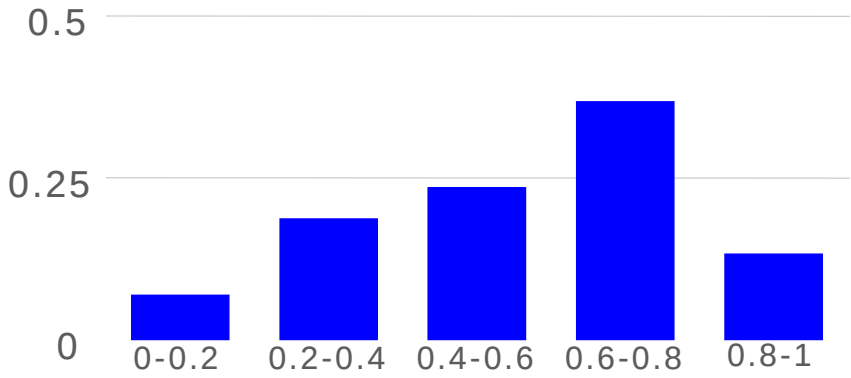


Copyright © 2006 Ventana Systems, Inc.

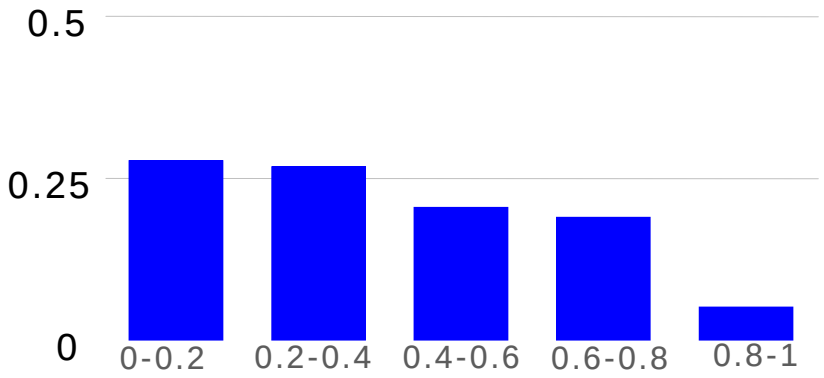
Model also calculates consumer surplus and NPV



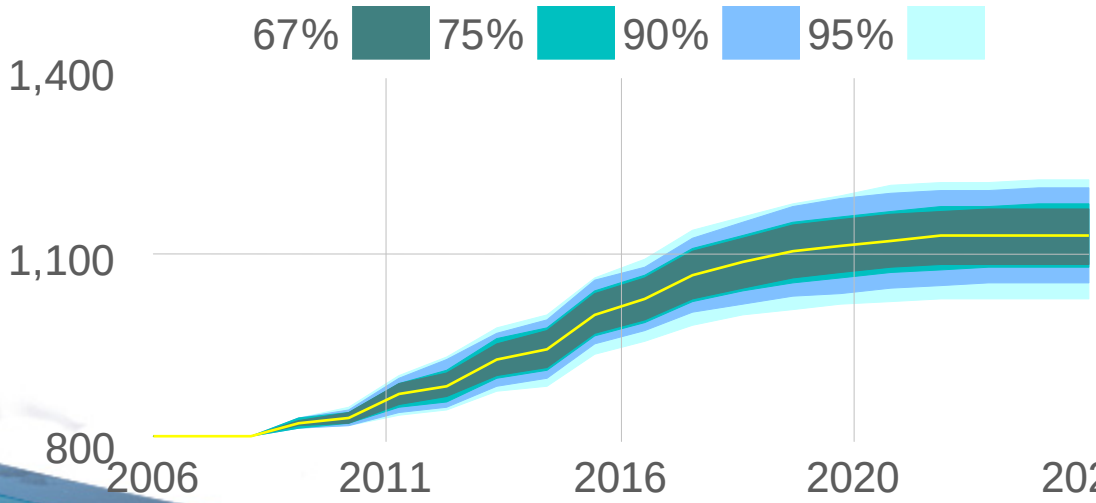
"… gang aft agley"



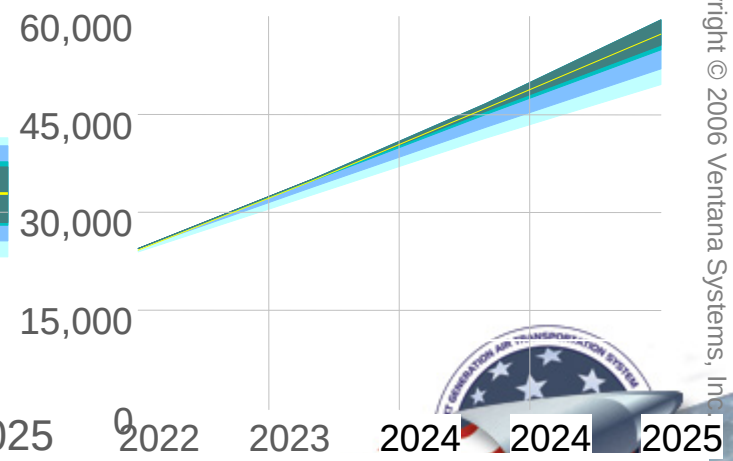
1. Assumed PDF of Intrinsic Task Success



2. Resulting Fractions Benefits Realized



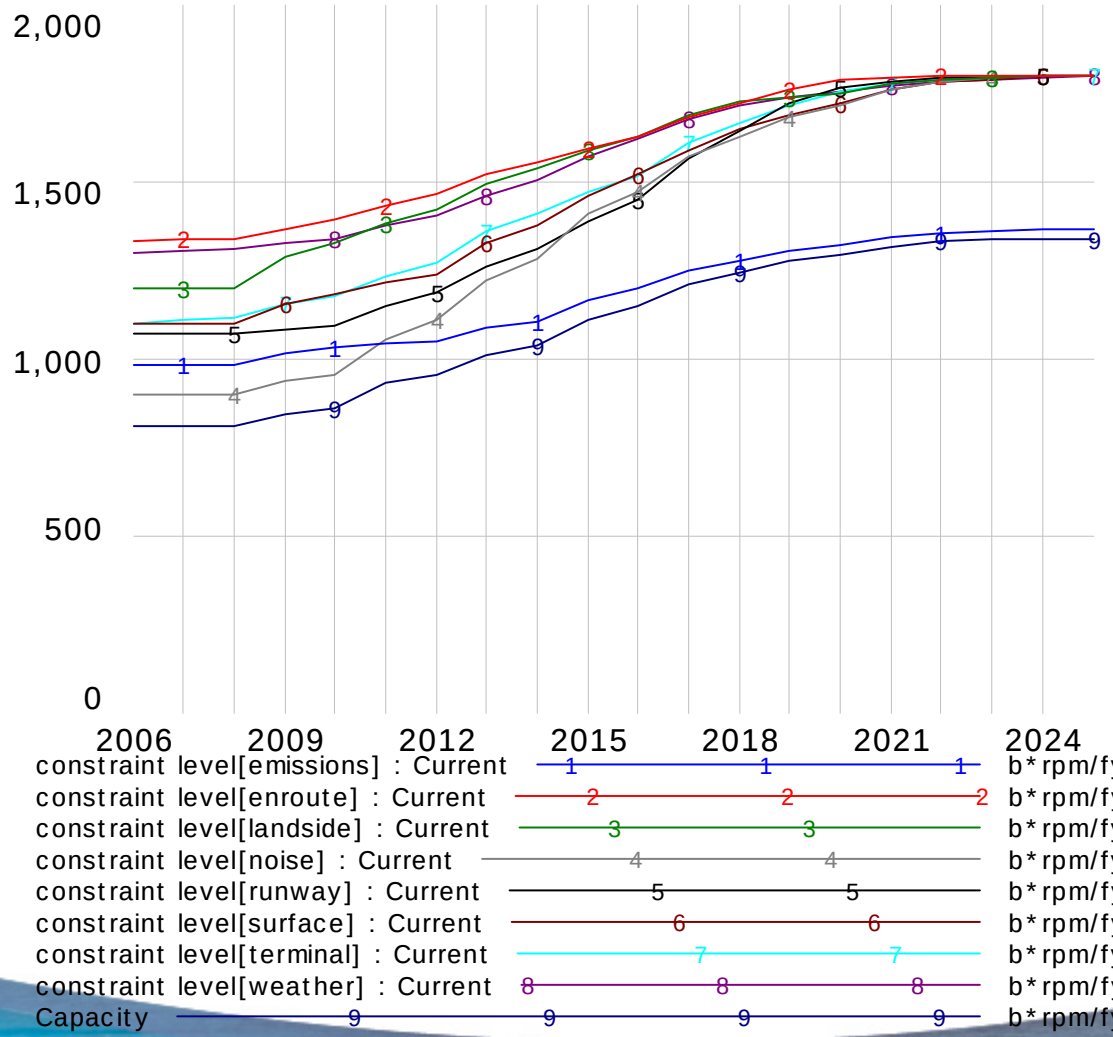
3. Resulting Capacity PDF (rpm/yr)



3. NPV through 2025 (M$)

Copyright © 2006 Ventana Systems, Inc.

Success in one constraint does not make up for failure in another



Copyright © 2006 Ventana Systems, Inc.