

Notes on Using the Mission Dependency Index



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NASA adopted Mission Dependency Index in 2004

- ✓ Better management of facilities' risks to programs.
- ✓ Better guide investment/divestiture decisions.
- ✓ Keep on the right side of external reviewers by using a credible set of decision tools.
- ✓ **Facility User generated.**

Latest updates ...

1. Bill's comments on the recent Inspector General's report on Real Property –
 - Problems noted with completeness, accuracy and currency of key metrics.
 - Bill suggests 3 year update cycle with additional updates when major changes in programs or facility assignments occur.

Latest Updates ...

2. Pending National Research Council report *Predicting Outcomes from Investments in Maintenance and Repair for Federal Facilities* –
 - Considers Risks to Outcomes
 - Strategies to Improve Outcomes
 - Communication of Strategies
 - Bill anticipates MDI to be cited as a Vehicle for Change Technology

Mission Dependency Index is built upon responses to two fundamental risk-based questions

1. How long can a facility be out of service before the user's ability to perform its mission is adversely impacted?
2. How difficult or costly is it to relocate the services or replace or repair a facility should it become unusable?

Condition and Dependency Relationship

Severity

- Potential degree of loss: Impact to Mission

Mission Dependency Index

- *Best Practice Recognition: ASCE, GSA, and IFMA*
- *Complies with the requirements of Executive Order 13327, Federal Real Property Asset Management*
- *It works - Independent validation by The Center for Naval Analysis (CNA) and Booz, Allen, and Hamilton.*

Probability

- The likelihood of the occurrence of an event:

Facility Condition and System Condition

- *A **low value** indicates higher **probability of a failure or shutdown.***

Mission Dependency Index

Expressed as a Risk Severity Descriptive Term

**Maximum Acceptable Time Limit on Interruption of Facility Use
to the Facility User/Occupant**

	Vacant	Mothballed	Future	Extended	Prolonged	Short	Brief	Urgent	Immediate
Impossible	Low	Moderate			Relevant		Significant		Critical
Extremely Difficult									
Difficult									
Possible									

**Ability to Replace/Relocate
Function/Service Provided by Facility User**

❖ Colors are approximate representations of MDI algorithm

Condition and Dependency Indices

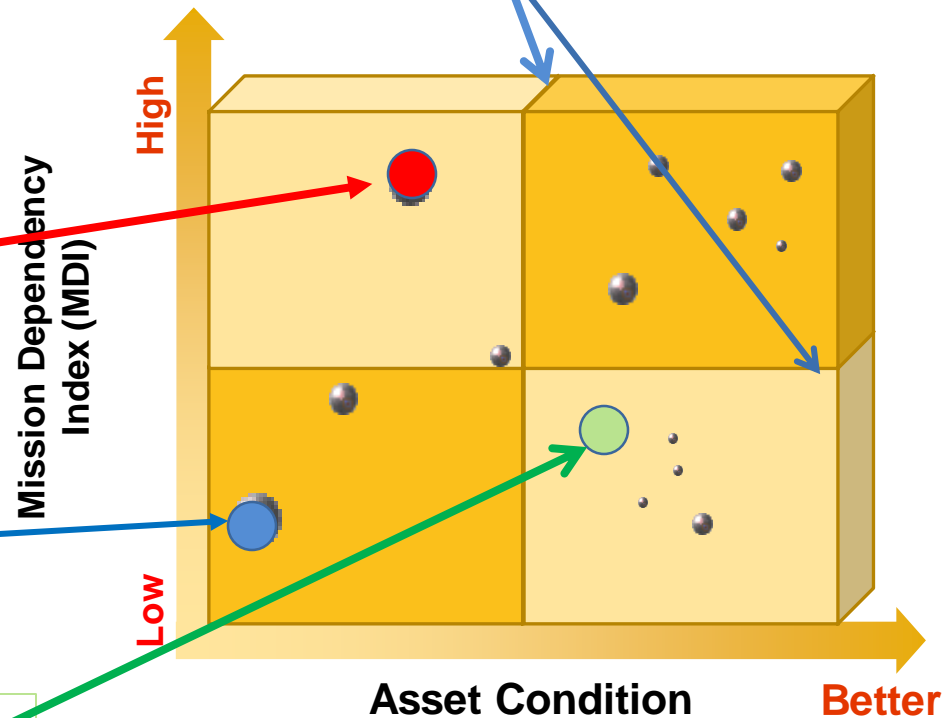
Supports analysis of investment options



How do we draw the lines?

Recapitalization/
Overhaul Candidate

Disposal/Divestiture
Candidate

Lease Candidate



-  More costly to repair/maintain asset
-  Less costly to repair/maintain asset

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Approaches to using MDI – previous citations and latest updates.

- Antelman, Dempsey & Brodt, Mission Dependency Index – A Metric for Determining Infrastructure Criticality, abstract on Transportation Research Board of the National Academies, <http://trid.trb.org/view.aspx?id=870745>
- J Whitaker & D Gelderman (contractor to NASA during development of DM Model) Building a Useful Asset Management Plan: *Enlightened FM Decisions*, IFMA World Workplace 2009
<http://www.feapc.com/LinkClick.aspx?fileticket=yb21AvGEVZk%3D&tabid=67>
- Dempsey, J, Facility Asset Management Doctrine: *A Strategy for Making Better Decisions at Lower Risk and Costs* http://www.stanford.edu/group/narratives/classes/08-09/CEE215/ReferenceLibrary/Facilities%20Operation/james_dempsey_uscg.pdf
- **Introduction to Facility Condition Assessments in Infrastructure Management Beginner, 2012 USAF Environment, Safety, and Occupational Health Training Symposium** This class discusses two tools currently in use in Air Force Asset Management: Mission Dependency Index (MDI) and the Facility Condition Index (FCI). An explanation of how the MDI and FCI were established, how they have evolved for Air Force Use, and how they are currently used for Activity Management purposes is discussed. Finally, information on the new Facility Condition Assessment methodology that will be used in the future will be presented.
- Brodt, B, Recommendation to Increase Use of the Mission Dependency Index, January 2010

Example of Original NASA SC and FC Goals

42 Categories	DM Facility Category: R&D and Test Buildings	CRV (\$M): 27% of NASA CRV	\$6,123
	System	Condition Target	
Goal Set by System		Rating	
	Structure	4	
	Roof	4	
	Exterior	4	
	Interior Finishes	4	
	Electrical	5	
	HVAC	5	
	Plumbing	4	
	Conveyances	5	
	Pgm Support Equip	5	
	FC GOAL =	4.4	

Goal for each Category

Example of Facility Sort Using MDI-Adjusted Goal

Location	Name	FC	MDI Description	MDI-Adjusted Goal FC	Delta (Goal - Actual)
M	SUBSTATION NO. XX	1.3	Significant	3.7	2.4
A	LABORATORY	2.5	Critical	4.6	2.1
J	SIMULATION LABORATORY	2.8	Critical	4.4	1.6
D	SUBSTATION NO. XX	2.4	Critical	4	1.6
J	SYSTEMS LABORATORY	2.9	Critical	4.4	1.5
A	EXPERIMENTAL DYNAMICS	2.5	Relevant	4.0	1.5
M	SUBSTATION NO. YY	2.2	Significant	3.7	1.5
M	SUBSTATION NO. ZZ	2.3	Significant	3.7	1.4
L	AAAA COMPLEX	2	Relevant	3.4	1.4
J1	LABORATORY	2.8	Significant	4.1	1.3
J2	LABORATORY	2.8	Significant	4.1	1.3
J	TEST FACILITY	3.2	Critical	4.4	1.2

Latest Updates ...

4. Maintaining the MDI model process and keeping the data current with minimum effort: ideas.
 - Answer the questions honestly. High MDI is not good; Low MDI is not bad.
 - High MDI (e.g above 85) suggests the need for a COOP
 - It's OK for MDI Champion to prepare tentative answers, but the Center Directorate Manager should affirm all answers based upon the current and reasonably projected workload – not dreams of work, but realistic expectations.