External Sustainability Factors and Risk Assessment

Sustaining Mission – Sustaining Community

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17 June 2010
1. REPORT DATE  
**17 JUN 2010**

2. REPORT TYPE

3. DATES COVERED  
**00-00-2010 to 00-00-2010**

4. TITLE AND SUBTITLE  
**External Sustainability Factors and Risk Assessment**

5. AUTHOR(S)  
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6. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)  
Marstel-Day, LLC, 2217 Princess Anne Street Suite 101-1A, Fredericksburg, VA, 22401

7. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)  

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSOR/MONITOR’S ACRONYM(S)

10. SPONSOR/MONITOR’S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT  
Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES  
Presented at the NDIA Environment, Energy Security & Sustainability (E2S2) Symposium & Exhibition held 14-17 June 2010 in Denver, CO. U.S. Government or Federal Rights License

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:
   a. REPORT  
      unclassified
   b. ABSTRACT  
      unclassified
   c. THIS PAGE  
      unclassified

17. LIMITATION OF ABSTRACT  
**Same as Report (SAR)**

18. NUMBER OF PAGES  
22

19a. NAME OF RESPONSIBLE PERSON

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*Standard Form 298 (Rev. 8-98)*  
Prescribed by ANSI Std Z39-18
Overview

- Sustainable Installation Definition
- Study Methodology
- Solution Architecture
- Current Process
- Literature Search
- Factor Considerations
- Study Products
- Challenges
- Related work: Compatibility issues for ranges and airspace
- Discussion
Context – AF Definition of a Sustainable Installations:

"A sustainable installation efficiently supports current operations with minimal impact on the built and natural environment without compromising the ability to meet future mission requirements."

A sustainable installation is supported by a planning process that takes a holistic view of the interactions and interrelationships of the natural and built environment and considers both internal and external (inside and outside the fence) stakeholders and issues.
**Methodology Phases**

**Problem Identification**
- Define End State
- Develop an Architecture

**Discovery**
- Understand the AF “As Is” processes
- Research Similar Systems
- Understand data sources and collection difficulties
- Obtain Approval for Next Steps

**Prototype Output Form and Information**
- Identify Key AF Factors
- Installations
- MAJCOM
- HAF Staff
- Identify sustainment factors important to others
- Prepare prototype output
- Identify development limitations and costs

**Obtain Approval to Develop Initial Product Set**

**Production**
- 5 Information Papers
- Supporting Analysis
- Recommendations for Way Forward
- Leadership Briefings
Decision Support Scenarios:
1) Compare **remaining capacity** from basing scenario at each AFB
2) Evaluate impact of trend lines on mission and vice versa.
3) Evaluate **intervention** options -- supply and demand, AFB and community.
Building to the Solution Architecture

Current State
- Limited database(s)
- Limited sources of information that are:
  - Accurate
- Limited analysis concerning external factors enhancing/inhibiting mission impacts
- Profile of selected negative interactions
- No Air Force interface with IT systems

Transitional State
- National and Air Force database(s)
- Information that is:
  - Accurate
  - Complete
  - Relevant
- Profile of key mission impacts
- Profile of key interactions
- Easily shared with NexGen IT

End State
- National database(s)
- Information that is:
  - Accurate
  - Complete
  - Relevant
  - Updated
  - Optimal ROI
- Complete profile of mission impacts
- Complete profile of interactions
- Easily shared with NexGen IT
Resource/Issue Sustainment Scenarios

Alternative Scenarios

<table>
<thead>
<tr>
<th>Factor</th>
<th>Current Supply or Issue</th>
<th>Future Supply or Issue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current Operations</td>
<td>Scenario 1</td>
<td>Scenario 3</td>
</tr>
<tr>
<td>Future Operations</td>
<td>Scenario 2</td>
<td>Scenario 4</td>
</tr>
</tbody>
</table>

Context

- Resource
- Community Demand
- AF Demand

Integrity - Service - Excellence
Current External Factors

Considered by A8

- Endangered Species
- Cultural Resources
- Encroachment
  - Noise
  - Accident Potential Zones
  - Imaginary Surface
- Spectrum Availability and Non-Interference
- Cost of Living Index
- Selected issues associated with Medical, Schools, Housing, and Services

ESF - External Sustainment Factors
Literature Review: Selected Documents

Scope of Work
- SIRRA (web-accessible database by CERL)
- Military Installations in Texas: An Atlas
- Selected AF Environmental Impact Statements
- INRMP/ICRMP
- 366 Report to Congress
- Natural Infrastructure Assessment (NIA)

M-D Additional
- Service Encroachment Control Plans
- Guam Compatibility Sustainability Study and OEA Defense Community Profiles 2009
- 2005 BRAC Files
- Web Search for sustainability assessment systems
- Sustainability Assessment of a Military Installation (SERDP) and Developing Headquarters Guidance for Army Installation Sustainability Plans (RAND)
- Military family support sites (QOL)
- Defense Critical Infrastructure Guidance and documents
Clouds loosely represent current data sources.

Cost v Benefits v Timing

- SIRRA
- Natural Infrastructure Assessments
- ICEMAPs
- TAMU Atlas
- Special Studies e.g. BO, Surveys, & EISs
Data Characteristics and Sources

**Characteristics**
- Relevant to decision process
- Available on scale that is useful
- Current (and kept current)
- Accurate
- Comparable among installations
- Uses a known metric
- Authoritative source
- Verifiable
- Cost-effective to obtain and evaluate

**Sources**
- Federal Agencies: US Census, USGS, EPA, NOAA, DoD....
- Commercial
  - GIS: ESRI, PolicyMap, EarthData, Imagenet....
  - Utilities: Energy, water, telecom
- State Agencies
- Regional Councils
- County Planning Authorities
- Other
Identify Key Factors through Consultations

- Visit Selected Installations
  - Langley AFB
  - Homestead Air Reserve Base
  - Buckley AFB
  - Patrick AFB

- Visit Selected MAJCOMS
  - ACC
  - AFSPC

- Establish a Headquarters Encroachment Management Committee/Working Groups

- External Sustainability Subject Matter Expert Workshop

- USACE Civil Engineering Research Laboratory (Completed)
Air Force Core Functions - 12
Category Groupings - 10
Sustainability Factors within the groupings – 41
Factor Score or Indication - 6
Air Force Core Functions

- Nuclear Deterrence Operations
- Air Superiority
- Space Superiority
- Cyberspace Superiority
- Global Precision Attack
- Rapid Global Mobility
- Special Operations
- Global Integrated ISR
- Command and Control
- Personnel Recovery
- Building Partnerships
- Agile Combat Support
Categories of Information

Category Groupings

- Military Operations – 4 Factors
- Spectrum – 2 Factors
- Resources – 5 Factors
- Extreme Events – 5 Factors
- Land Use Regulations – 5 Factors
- Support Capacity - 7
- Transportation and Access - 2
- Supply – 4 Factors
- Community Relationship – 4 Factors
- Trends – 3 Factors
List of Factors Under Consideration

Factors
- Development Inside 65 DNL Noise Contour
- Incompatible Development in CZ/APZs
- Obstructions – Imaginary Surfaces around airfields
- Obstructions – Other
- Spectrum Interference – EMI
- Spectrum Interference – Physical
- Electric Energy Reliability
- Military Highway System
- Commercial Airport Proximity
- Water Supply
- Receiving Water Quality
- Threatened and Endangered Species
- Air Quality

Factors (con’t)
- Schools Availability and Capacity
- Schools Quality
- Housing Availability
- Hurricanes
- Lightning Density
- Sea Level Rise (Climate Change)
- Seismic Activity
- Tornadoes
- Local Govt Regulated Land
- State Govt Regulated Land
- Federal Govt Regulated Land

Factors (con’t)
- Native American Regulated Land
- Unregulated Land
- Small Businesses
- Skilled Trades
- Technical Schools
- Universities
- Local Ex Officio Membership
- Media Monitoring
- MOU w/ Local Police & Fire Departments
- MOU/Membership with Regional Councils
- Economic Index
- Population Growth Rate
- Unemployment Rate
## Factor Indications

- Identify the factor potential to affect the AF action
- Looks at negative and positive outcomes

### KEY

<table>
<thead>
<tr>
<th>Factor Indication to Mission</th>
<th>Indicator Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Significant Threat</td>
<td>Red</td>
</tr>
<tr>
<td>Moderate-to-Significant Threat</td>
<td>Orange</td>
</tr>
<tr>
<td>Moderate Threat</td>
<td>Yellow</td>
</tr>
<tr>
<td>Threat Developing</td>
<td>Green</td>
</tr>
<tr>
<td>No Threat</td>
<td>Blue</td>
</tr>
<tr>
<td>Enhances Mission</td>
<td>Purple</td>
</tr>
</tbody>
</table>

Identify the factor potential to affect the AF action
Looks at negative and positive outcomes
Prototype Installation Fact Sheet

- Display Requirements
  - A satellite map of the installation, with both an internal and external view.
  - Geographic context of the installation.
  - A description of the installation mission.
  - Risk Assessment table for each mission currently undertaken at the installation.
  - Discussion of current encroachment monitoring and management efforts at the Installation.
  - Summary of datasets used to conduct analysis.

- Uses an atlas layout approach

- Eventually must translate into a Heads Up Display
Volume 1
- Introduction
- Executive Summary
- Installation Fact Sheets
  - Geographic setting
  - Mission description
  - Factor evaluation table
- Supporting Documentation
  - Data sources
  - Installation-specific analysis

Volume 2
- Introduction
- Factor Selection
- Factor Scaling
- Factor Scoring by Mission
- Installation Selection
- Lessons Learned
  - Level of effort
  - Data characteristics encountered
  - Limitations to methodology
- Way Ahead

Volume 1 demonstrates evaluation of factors for selected installations
Volume 2 discusses project purpose, methodology and lessons learned

Integrity - Service - Excellence
Early Challenges

- Identifying which external factors have highest value to AF to ensure greatest return on level of effort
- Rating levels of factors consistently in a way that
  - Can be accurately understood
  - Allows meaningful comparisons of installations
- Defining region of influence in a manner that is comparable among installations
- Obtaining data appropriately scaled to the vicinity of installations
- Ensuring that the tool will be used where envisioned (buy-in).
- Ensuring that the efforts mesh constructively with related efforts, such as NIA, AICUZ, JLUS
Related Work

Topical Areas

- Noise and Safety Compatibility Criteria for Ranges and Air Space: Choice of Land Use Categories
- Alternative Energy Impacts on Ranges and Airspace

Purpose is to initiate an AF encroachment research effort and solve AF problems simultaneously

Pursue RDTE and policy research

- Air Force and Army laboratories
- SERDP/ESTCP
- Air Force Academy, Senior War Colleges, FFRDCs, and Science Board
Conclusion

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- Study Methodology
- Solution Architecture
- Current Process
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- Factor Considerations
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