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Multi-Use Facilities - Repurposing Facilities Infrastructure to Support the Multi-customer Environment

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Multi-Use Facilities - Repurposing Facilities Infrastructure to Support the Multi-customer Environment

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- Extensive use of Local Resources
- World Wide Experience in Partnering



48 Years of Experience at CCAFS and KSC



Summary

- Repurposing existing facilities to support the multi-customer has advantages for the facility owner and the eventual tenant.
- Determining the facility changes necessary is reasonably straightforward although it can be a significant amount of work.

Old Yankee Stadium



New Yankee Stadium



It Is Multiuse



Better Multi-use



Photohome.com

Better Multi-use



Better Multi-use



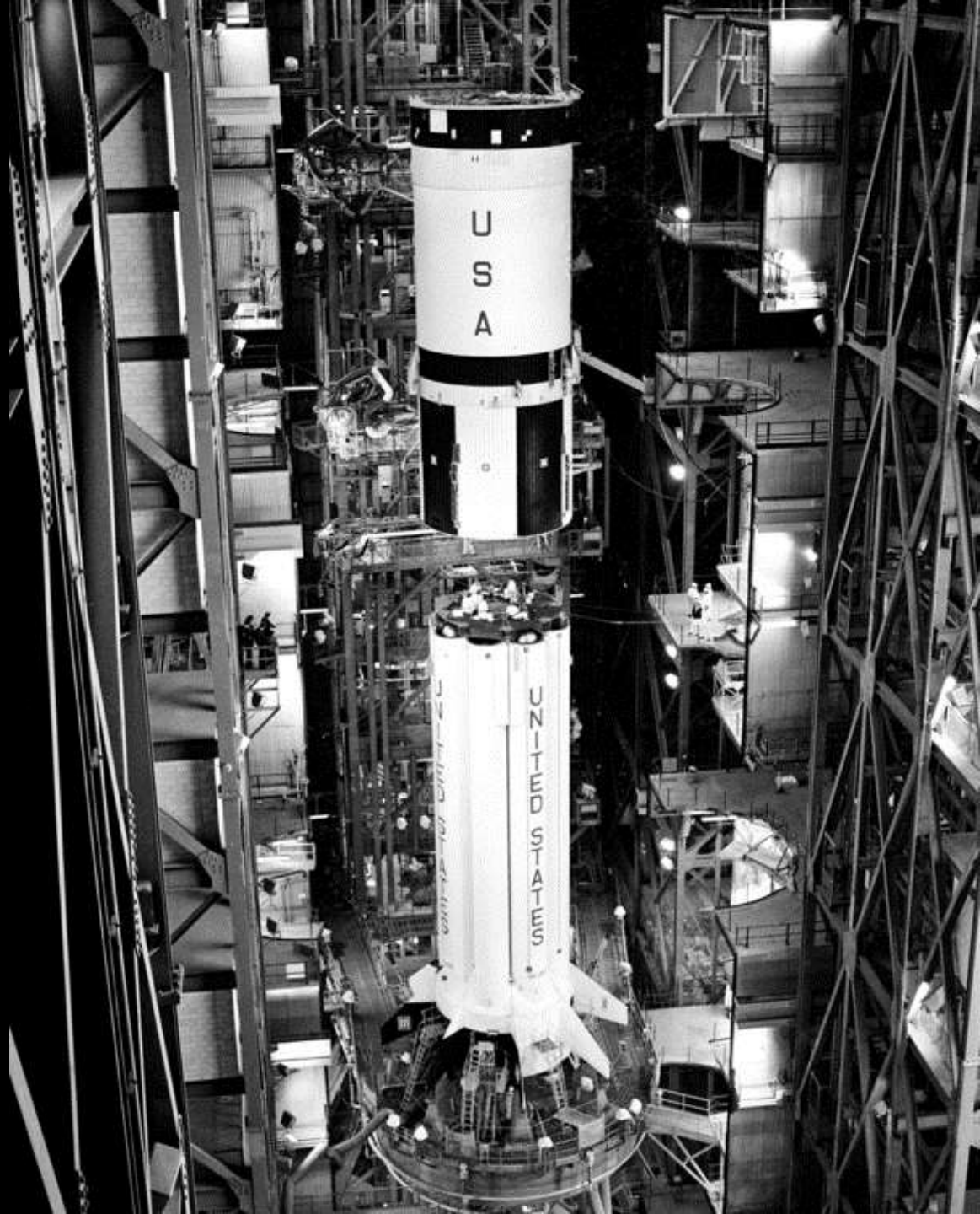
Better Multi-use



**KSC has a history of multi-use
– sort of....**











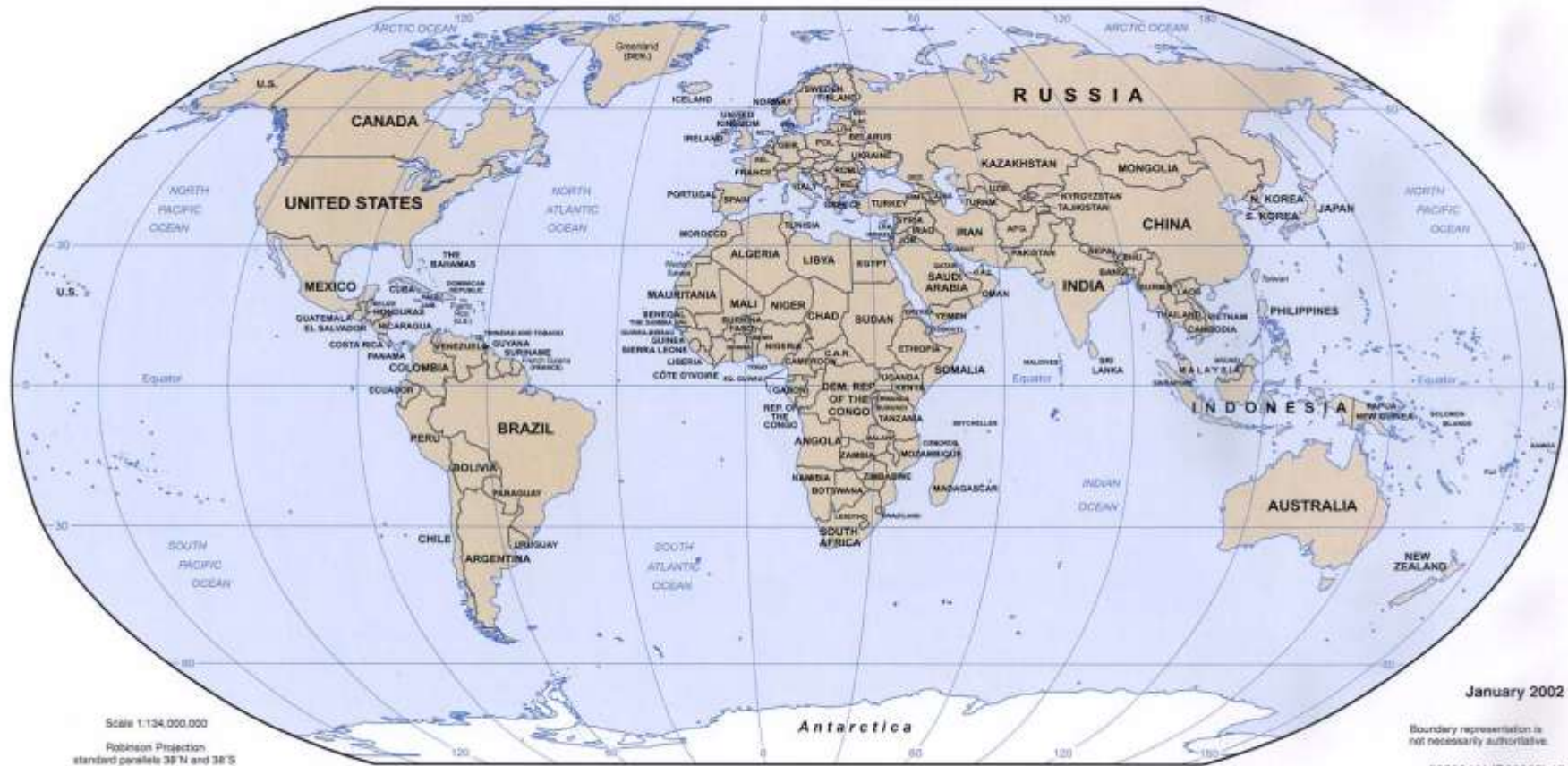








Where in the world is multi-use?



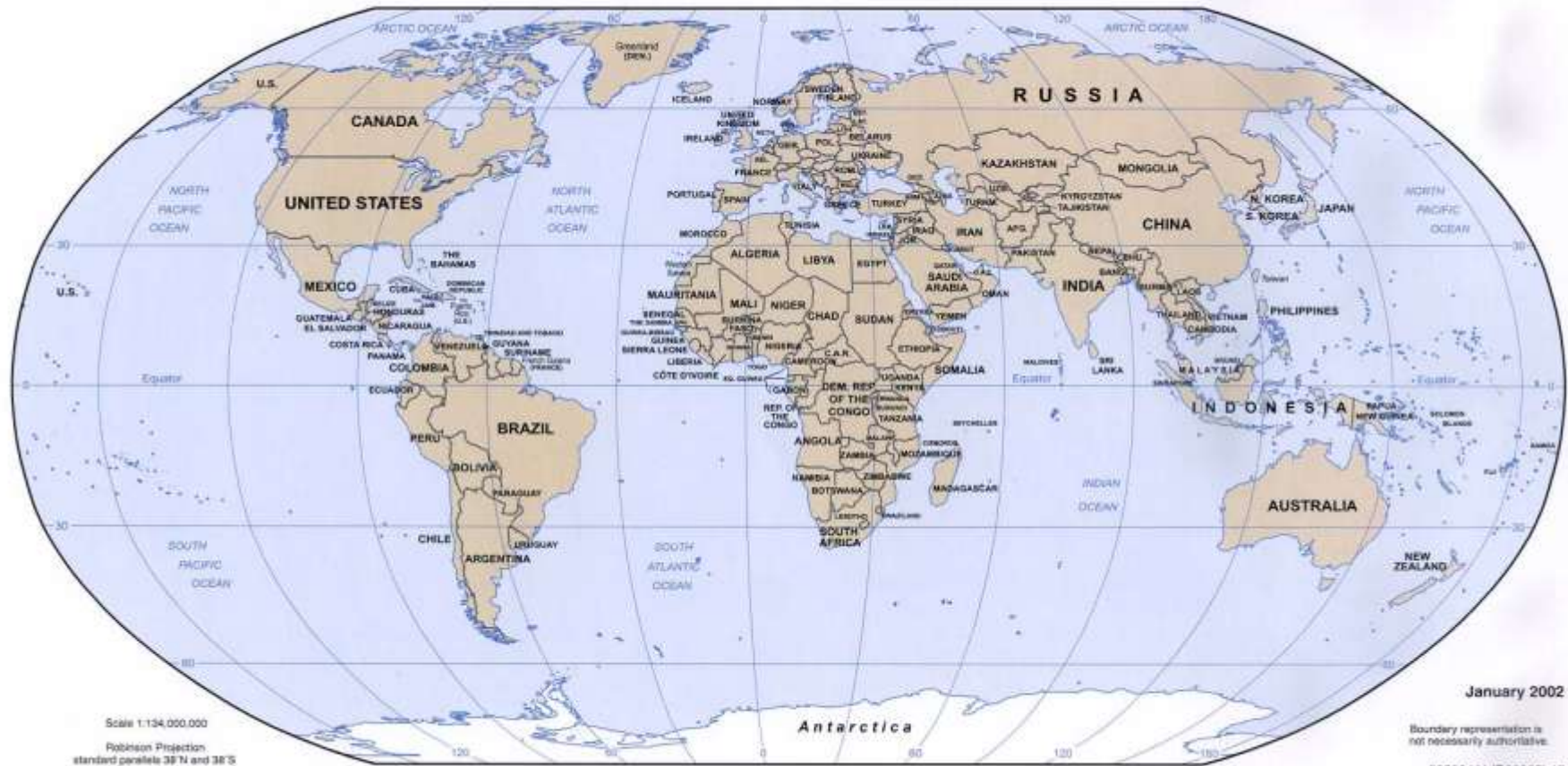
How do we get there?

- Understand why multi-use is desirable
- Decide the best usage categories
- Identify target tenants
- Perform an operator needs assessment
- Analyze the facility's capabilities, capacity, and restrictions
- Perform a gap analysis
- Develop Operational Concepts
- Map modifications to concepts
- Make decisions

Steps In The Process

- Understand why multi-tier is desirable
- Decide the best user categories
- Identify target tier
- Perform an operational needs assessment
- Analyze the entity's capabilities, capacity, and restrictions
- Perform gap analysis
- Develop Operational Concepts
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We have a course Where does it take us



Understand Why Multi-use Is Desirable

Decide The Best Usage Categories



FOR BEST USE:

PLEASE READ ALL DIRECTIONS. WASH HANDS. CLEAN ALL SURFACES OF DIRT. TURN OFF THE TV. TURN OFF ANY MUSIC. UNPLUG THE PHONE. GET EVERYONE ELSE OUT OF THE ROOM. BREATHE DEEPLY. QUIET YOUR MIND. MAKE SURE YOU GET A GOOD NIGHT'S SLEEP. DO NOT CONSUME ANY ALCOHOL 36 HOURS BEFORE USING. FORGIVE YOUR PARENTS. COME TO TERMS WITH YOUR PAST. ACCEPT WHO YOU ARE. MAKE PEACE WITH YOUR MANY DEMONS. REALIZE THAT YOU ARE A UNIQUE BEING IN THE UNIVERSE AND ARE PART OF A PLAN GREATER THAN YOU CAN POSSIBLY IMAGINE. STORE AT ROOM TEMPERATURE.



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01 efficient

We work with industrial and commercial clients to share their carbon footprint for free.

Together we help reduce stress from the summer bird during times of peak energy demand, and we even pay for the privilege!

As a community we can more efficiently manage our energy use to avoid the most polluting forms of power. We do this without changing your existing electricity supplier and with no upfront cost. Join us now and help create a healthier future for everyone.

01 How It Works?

02 The Service

03 The Process

HOW TO MAKE THE BEST USE OF TECHNOLOGY IN WEB DESIGNING

Decide The Best Usage Categories

Launch Vehicle	Booster and Upper Stage	Satellite and Spacecraft	Launch	Hazards	Operational restrictions	Other
Large Vehicle	Solid	Manufacturing	Horizontal	Industrial	Parallel Hazardous Operations	Offline Shops
Small Vehicle	Liquid	Assembly	Vertical	Pyrotechnics	Restricted Tenant Activity	Offline Labs
Stacking	Manufacturing	Testing	Small vehicle	Hypergolics	Man loading restrictions	Office Space
Testing	Assembly	Fairing Operations	Large Vehicle	Cryogenics	Anchor Tenant Preferences	Secure Programs
Integration	Testing	Vehicle Integration		Radiant Energy		

Identify Target Tenants



Perform An Operator Needs Assessment



Perform An Operator Needs Assessment



Perform An Operator Needs Assessment

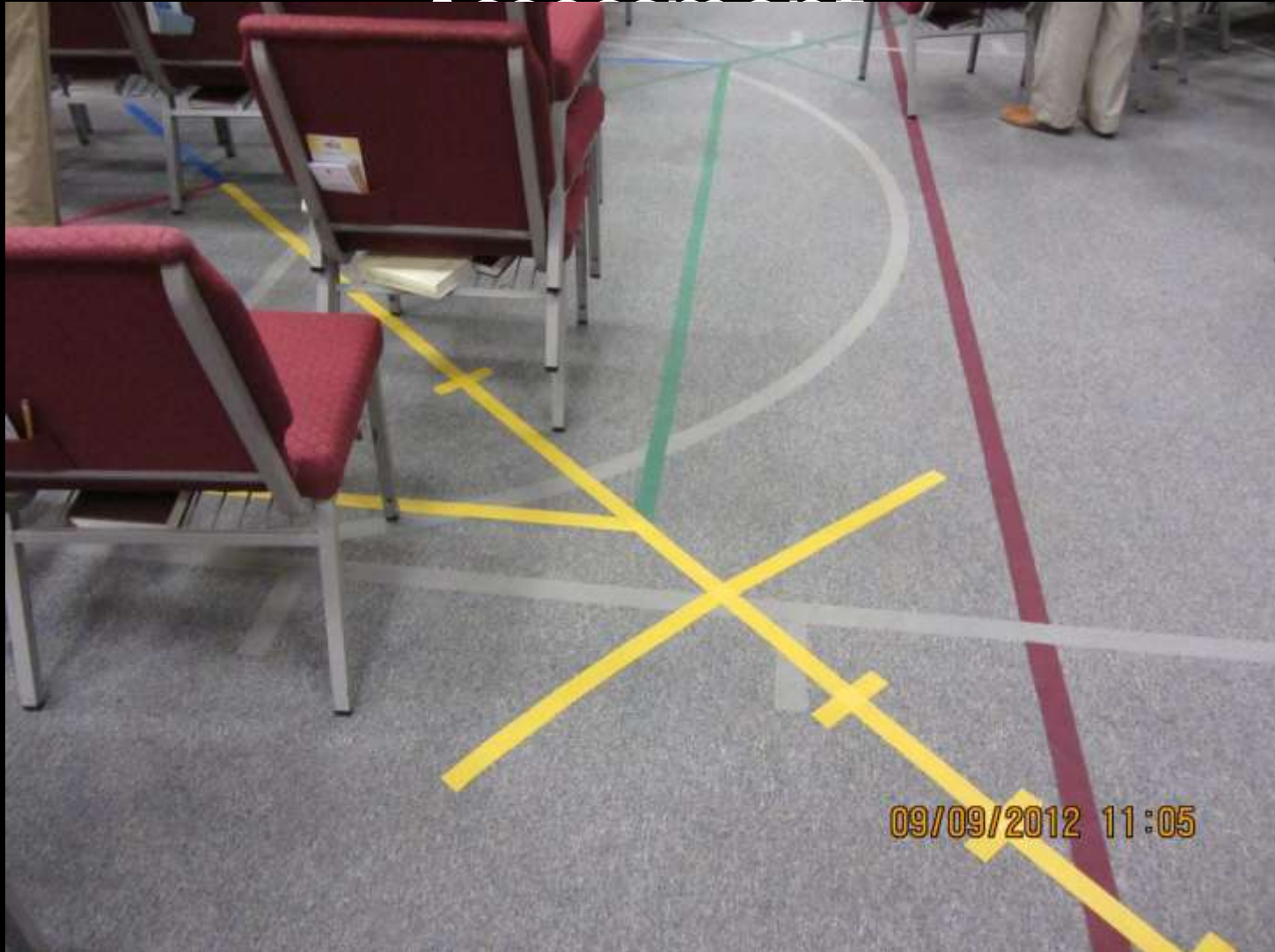


Perform An Operator Needs Assessment



Perform An Operator Needs

Assessment



Perform An Operator Needs Assessment





Information

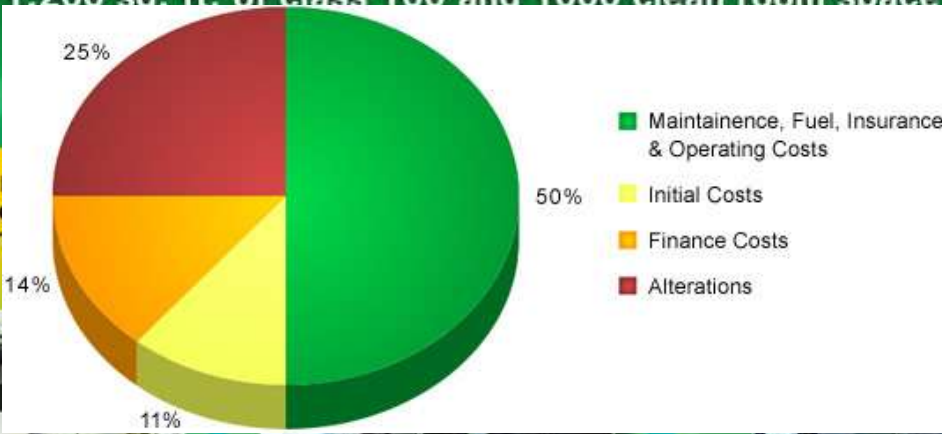
Source	Important Information	Unimportant Information
User	Facility time requirements	Detailed operations schedule
Owner	Facility availability	Other user schedules
User	Office space requirements	Management team identification
Owner	Undocumented changes	Last occupant
User	Spacecraft hazardous propellants	Orbital Parameters

Survey - Problems

Analyze The Facility's Capabilities, Capacity, And Restrictions

 **NanoApplications Center** 
Nanoscale Science and Technology Laboratory

1,200 sq. ft. of class 100 and 1000 clean room space.




Category	Percentage
Maintenance, Fuel, Insurance & Operating Costs	50%
Initial Costs	14%
Alterations	25%
Finance Costs	11%

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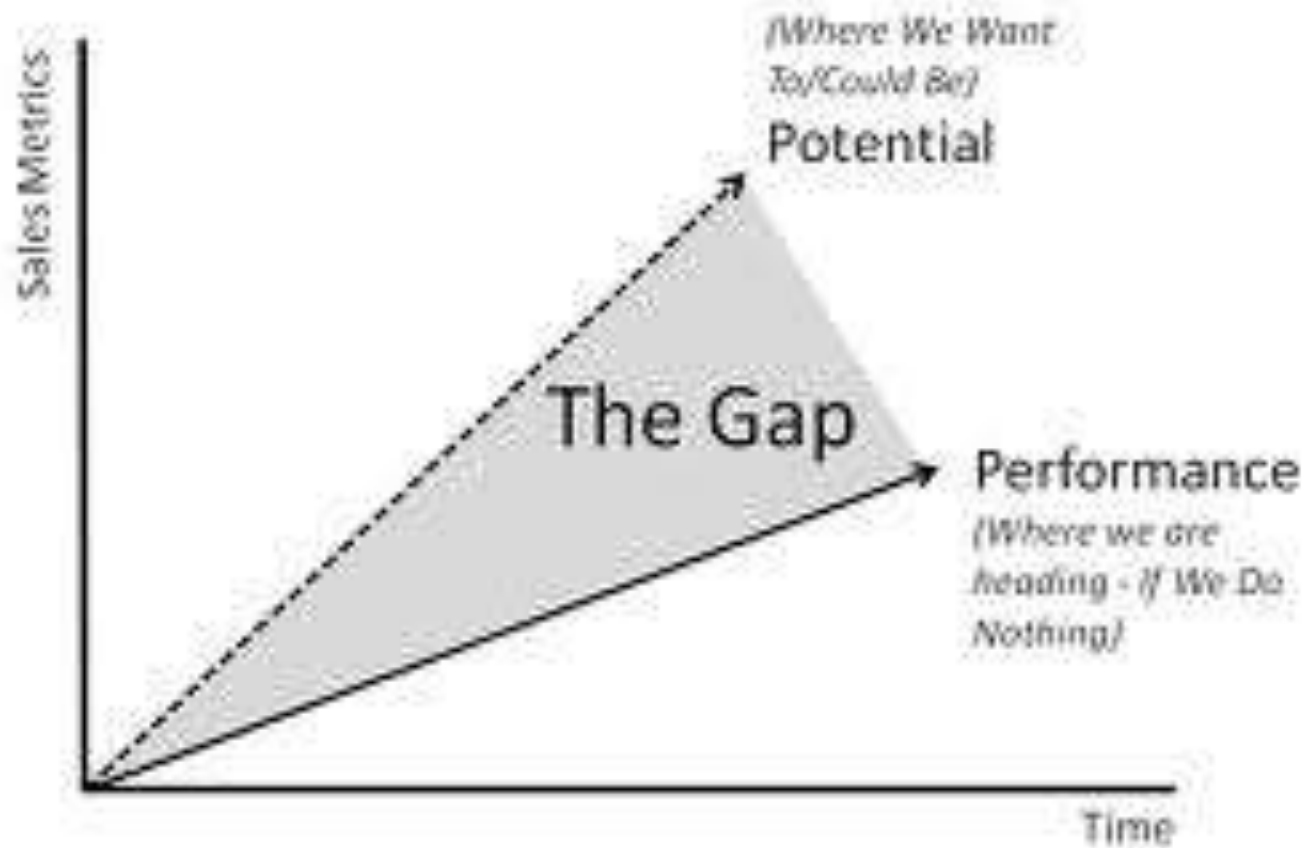
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OAK RIDGE NATIONAL LABORATORY
MANAGED BY UT-BATTELLE FOR THE DEPARTMENT OF ENERGY

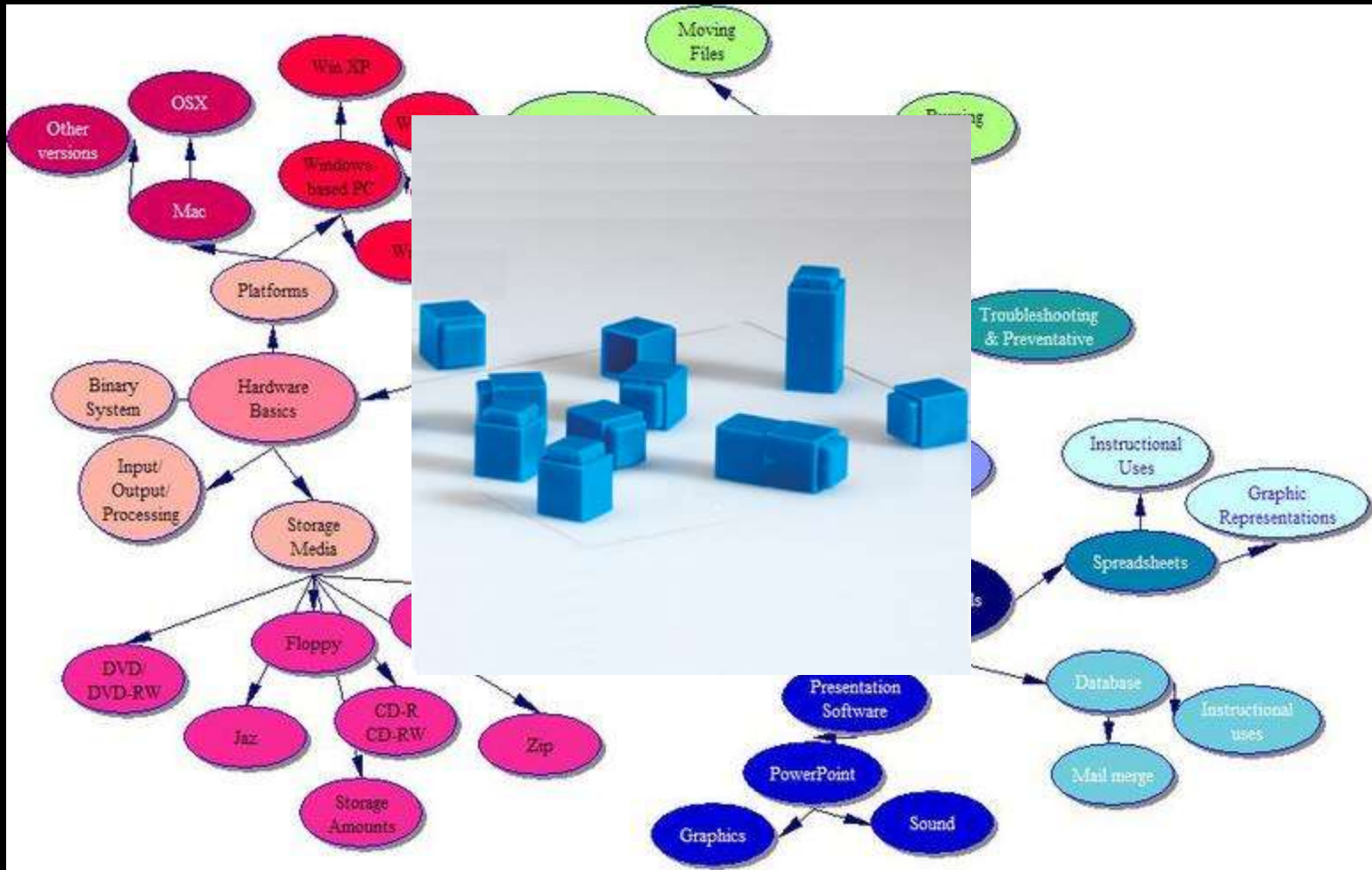
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www.ornl.gov/sci/nstf/index.htm

Perform A Gap Analysis



Develop Operational Concepts

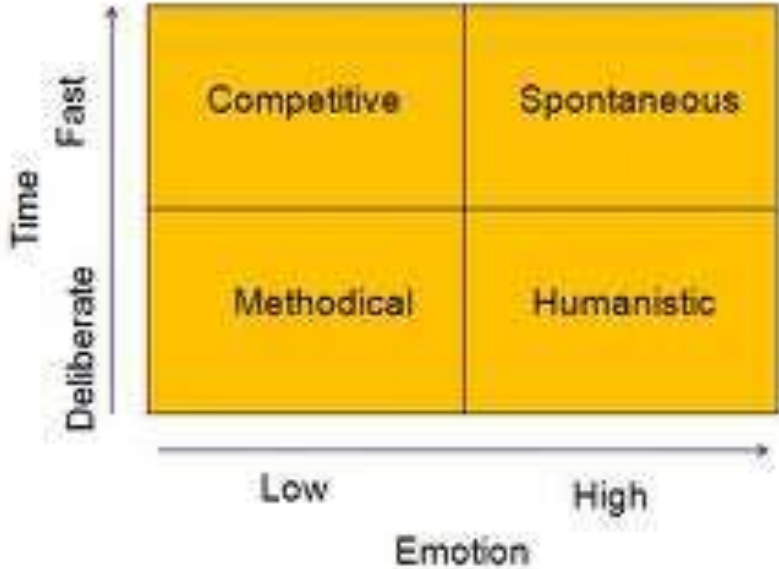
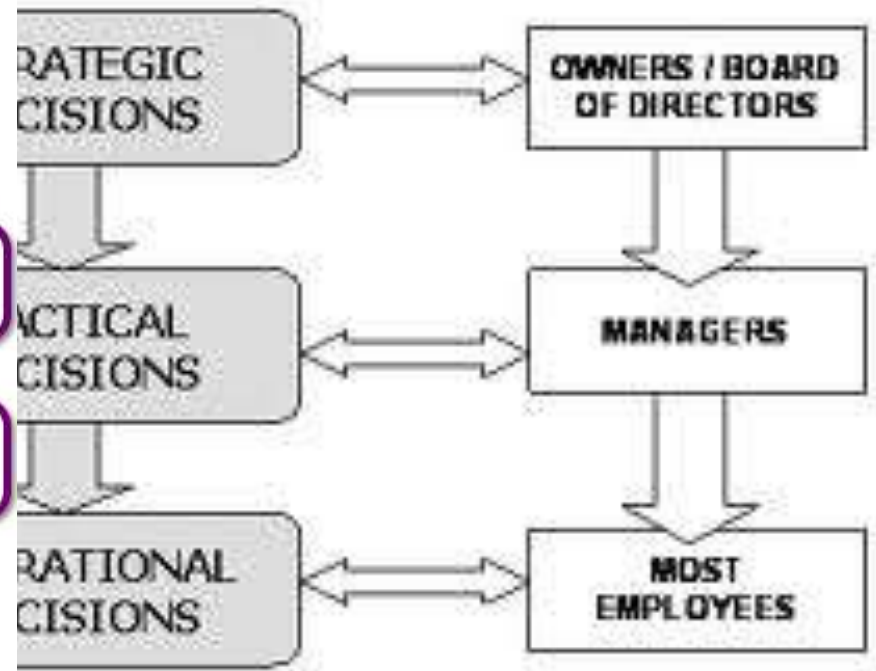
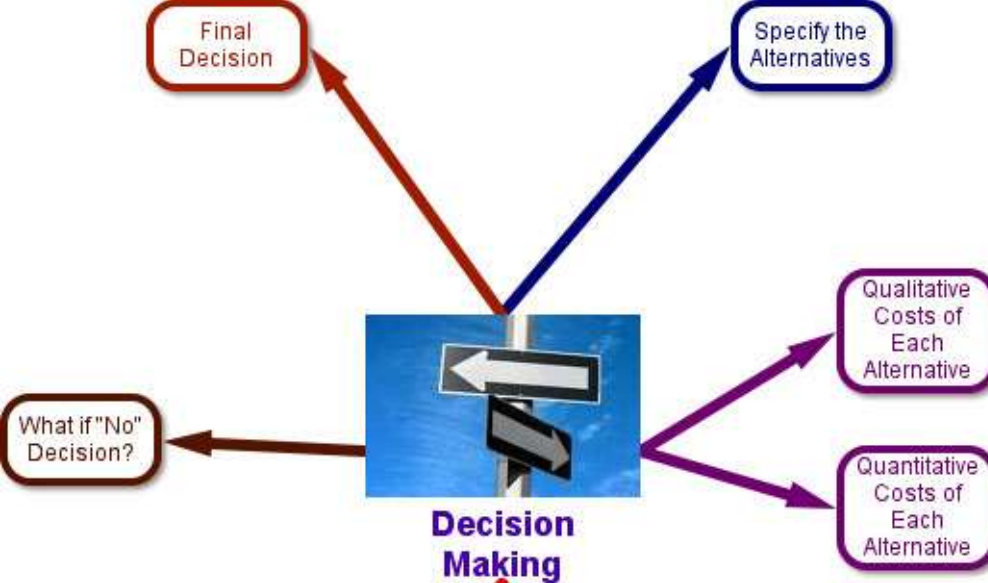


Each Concept Should Include

- An overall operational concept
- Constraints limiting the use of the facility
- Types of users for which the facility is suited
- Needed facility modifications
- Operational policies, and procedures required for multiple users

Map Modifications To Concepts

Modification Areas (per Concept)
Facility
Life Safety
Fire Suppression
Fire Alarm and Detection Systems
Physical Security/Access Control
Visual Separation
Safety/Debris Protection
Mechanical Systems
High Pressure Gas Systems
Ground Coolant Systems
HVAC Systems
AHU and CHW/HHW Metering
ML/MLP High Pressure Gas interfaces
Electrical Systems
Electrical Systems Metering
IT/Communications
Power Systems Reliability
Operational Policies and Considerations
Operation Control Locations



Make Decisions

The modification list can be extensive. The owner should use whatever decision process best suits his organization, however the allowed types of decisions should be a controlled set. The process is highly iterative and it is easy to get lost in that process.

Allowable Decisions

- Do the change
- Do the change when customer appears
- Expect the customer to provide
- Never do the change
- Neutral - make no decision until forced to do so

Multi-Use O&C



When starting such a process consider:

- Organically grown systems not conducive to isolation, metering, etc.
- Cost to upgrade existing facilities (e.g. Code, Infrastructure) can be very high
- Expectations of future occupancy are generally unrealistically high
- Be prepared for unexpected cost drivers, e.g. life safety access
- Consider not only total users but also impact between users due to parallel operations
- Operations always take longer than scheduled
- Have realistic expectations of when your facility will be available - existing tenants schedules may extend
- Modifications take longer than planned
- Recognize down time (unoccupied) period requirements due to modifications or maintenance
- Before modifying for parallel tenants, understand if money is available for parallel programs
- “World Class” may be mythical. It drives
 - Higher costs
 - Decreased flexibility
 - Generally applicable only to a specific class of customers

When starting such a process consider (2):

- Metering - is it really necessary?
- How much full cost accounting to each individual client is appropriate?
- Understand future maintenance costs and its impact to customers
- Recognize the down time for implementing multi-use. Single use may be appropriate.
- Technical vs. Policy Decisions - know which ones you are making
- What does your anchor customer want and how do you keep him happy above all others?
- Identify Tenant vs. Common Areas
- Who pays?
- Know current and future operational restrictions
- Recognize your tenants safety and proprietary information concerns
- Beware of upgrade for upgrade sake
- Know what tenants will bring with them - it may reduce your costs

Biggest Lesson

The Best Multi-use modification process

Be Multi-use from the beginning

What Do You Want To Be When You Grow Up?

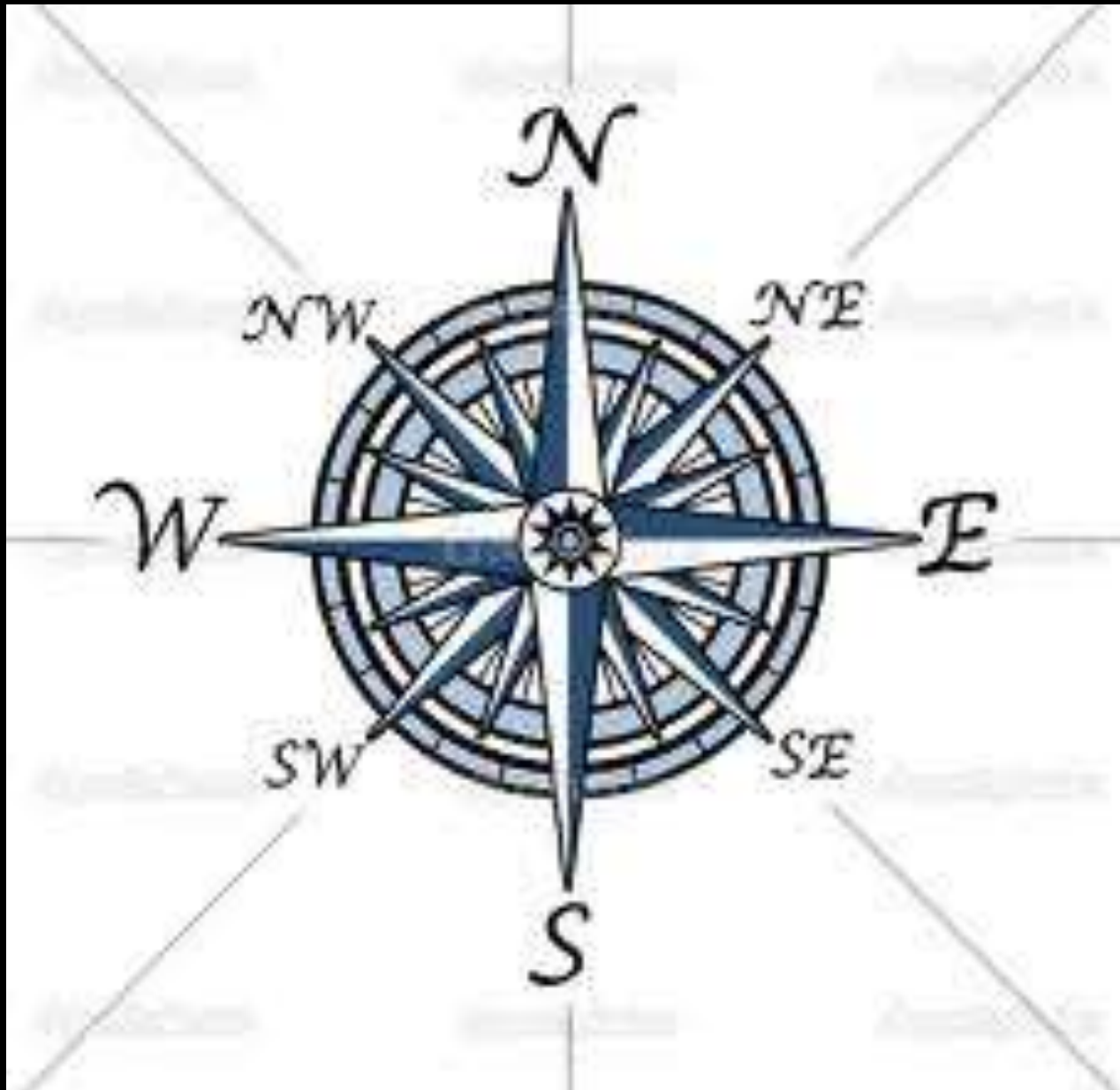


What Do You Want To Be When You Grow Up?



Steps In The Process

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Do Not Get Lost In the Process



Alan T. DeLuna

Dave Hertzler

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