

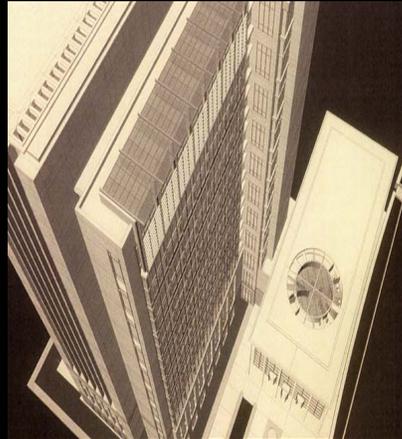
Sustainability: From Dreams to Operations

Making and Selling the Business Case



Rochester, New York
August 9, 2004

David Eakin, PE
Office of the Chief Architect
Public Buildings Service



Denver Courthouse

GSA



GSA Context

- Public/Federal Bldgs.
- Own/Manage Many Bldgs.
- Large Const. Program
- Long Life Buildings
- Serve Clients/Charge Rent
- Critical Operations
- Many Program Goals
- Leading Technologies
- We Contract Everything



GSA



Many Business Cases To Make

Many Motivations To Use/Contend

- **Developer/Owner**
- **Clients**
- **Designers**
- **Construction Manager**
- **Quality Assurance Team**
- **Construction Contractor**
- **Operating Staff**

GSA



The Business Case

Decisions Influenced By Cost Benefits, Principles, Direction

- **How Do I Get Everything When I Have a Limited Budget?**
 - **Program What You Want** *(Scope/Cost)*
 - **Integrate Your Decisions** *(Go for Win-Win)*
- **How Do I Know What I Am Doing Will Really Cost Less Over The Life of the Facility?** *(Credibility, Deliverability)*
 - **Life Cycle Cost Your Options** *(If you can)*
 - **Commissioning** *(Total Building Commissioning)*

GSA



The Business Case

- **How Do I Get Everything When I Have a Limited Budget?**
 - **Program What You Want** (Scope/Cost)
 - *Integrate Your Decisions* (Go for Win-Win)
- **How Do I Know What I Am Doing Will Really Cost Less Over The Life of the Facility?** (Credibility, Deliverability)
 - *Life Cycle Cost Your Options* (If you can)
 - *Commissioning* (Total Building Commissioning)

GSA



Program What You Want

i.e. You Have to Contract/Ask for It

- **Reference Sustainable Design Criteria**
 - **GSA's Facilities Standards (P-100)**
 - **Whole Building Design Guide**

GSA



Design Standards/Criteria

- Stresses Integrated Design
- Energy Performance Goals
- LEED Certification and Energy Goals
- Life Cycle Costing
- Discipline/System Design Criteria
- Submission Requirements
- Defines Commissioning

Available on the Internet: www.gsa.gov/p100

FEDERAL BUREAU OF INVESTIGATION
OFFICE OF THE CHIEF OF POLICE

GSA



Whole Building Design Guide

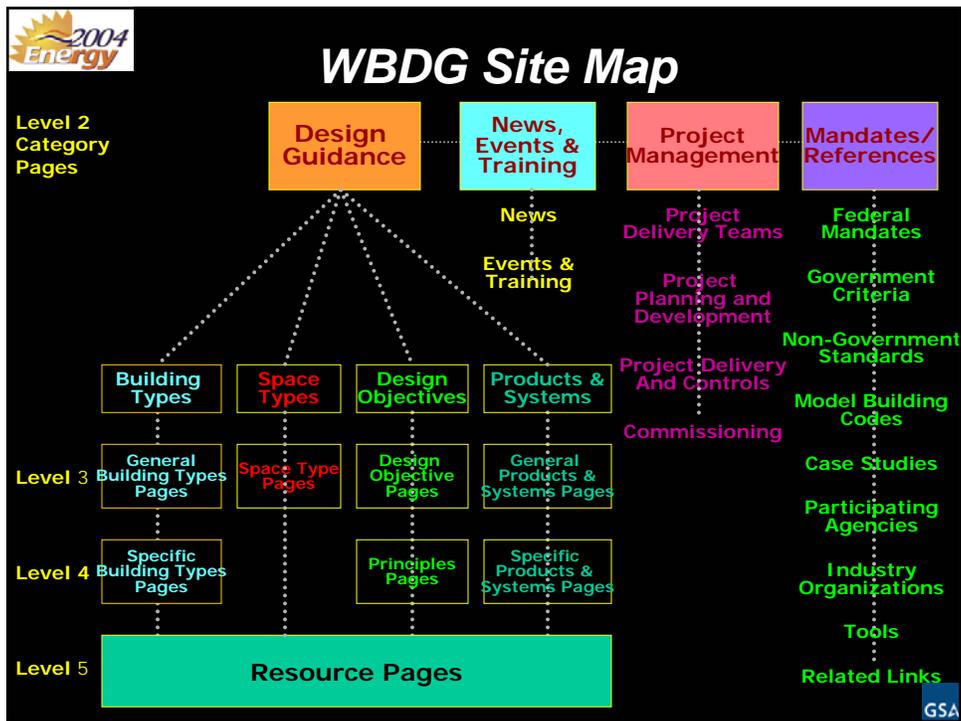
Check It Out, It's FREE!

- Multi-Agency Supported Portal to Technical Subjects/Information, Owned by NIBS
- Library: Access to Virtually All Federal/Private Sector Documents - Real Property Development
- Librarian: Explanatory Text With Hot-Links to Most Important Policy, Criteria, and Guidance
- Cross-References Facilitate Design Integration
- Continuously Updated
- Ask Questions, Provide Comments

www.wbdg.org



GSA



-
- ## Program What You Want
- i.e. You Have to Contract/Ask for It*
- Reference Sustainable Design Criteria
 - GSA's Facilities Standards (P-100)
 - Whole Building Design Guide
 - Know Your Application Costs (Premiums)**
 - LEED Cost Study**
 - Applications Guide**
- GSA**



Construction Cost Impacts

New Courthouse

	Certified		Silver		Gold	
	1A	2A	3A	4A	5A	6A
\$/GSF	(\$0.81)	\$2.32	(\$0.10)	\$8.96	\$2.47	\$17.19
% Change	-0.4%	1.1%	-0.1%	4.1%	1.1%	7.9%

Office Building Modernization

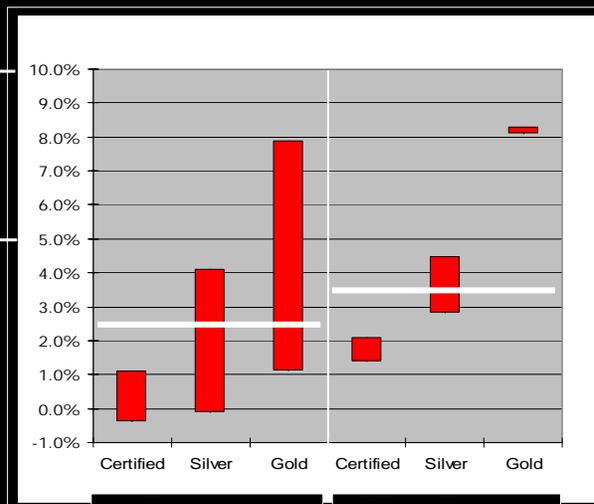
	Certified		Silver		Gold	
	1B	2B	3B	4B	5B	6B
\$/GSF	\$1.79	\$2.73	\$3.60	\$5.97	\$10.65	\$10.65
% Change	1.4%	2.1%	2.8%	4.5%	8.3%	8.1%



Construction Cost Perspective

Design Contingency

Estimating Accuracy



Courthouse

Office Building





What's In the Soft Costs?

Fees = Design for Construction Cost Premiums + the following...

- Facilitate LEED Charrette
- Point of Contact
- Technology Advisor
- Develop LEED Action Items
- Materials/Systems Research
- LEED Calculations for IEQ Credits
- Energy Calculations
- LEED Credit Interpretations
- Specification Edits
- Coordinate LEED Submittals With CM
- Review Contractor Submittals
- Assemble LEED Documentation

GSA



Design Team Fees

(With LEED Consultant)

New Courthouse

	Certified		Silver		Gold	
	1A	2A	3A	4A	5A	6A
	In Thousands					
Design Fee Premium	\$83.8	\$97.7	\$83.8	\$120.1	\$134.0	\$182.5
LEED Documentation & Certification	\$22.4	\$22.4	\$23.6	\$23.6	\$26.0	\$26.0
Soft Cost Totals	\$106.1	\$120.1	\$107.5	\$144.6	\$159.9	\$208.5
Cost Impact (\$/GSF)	\$0.41	\$0.46	\$0.41	\$0.55	\$0.61	\$0.80

Office Modernization

	Certified		Silver		Gold	
	1A	2A	3A	4A	5A	6A
	In Thousands					
Design Fee Premium	\$97.7	\$99.9	\$107.4	\$123.2	\$184.3	\$181.0
LEED Documentation & Certification	\$26.7	\$26.7	\$28.0	\$28.0	\$30.3	\$30.3
Soft Cost Totals	\$124.4	\$126.6	\$135.4	\$151.2	\$214.6	\$211.3
Cost Impact (\$/GSF)	\$0.41	\$0.41	\$0.44	\$0.49	\$0.70	\$0.69

GSA



Experienced Design Team Fees

(w/o Using LEED Consultant)

New Courthouse

	Certified		Silver		Gold	
	1A	2A	3A	4A	5A	6A
	In Thousands					
Design Fee Premium	\$88.1	\$93.3	\$88.1	\$116.5	\$116.5	\$160.5
LEED Documentation & Certification	\$24.3	\$24.3	\$26.0	\$26.0	\$29.5	\$29.5
Soft Cost Totals	\$112.4	\$117.6	\$114.1	\$142.5	\$146.0	\$190.0
Cost Impact (\$/GSF)	\$0.43	\$0.45	\$0.44	\$0.54	\$0.56	\$0.73

Office Modernization

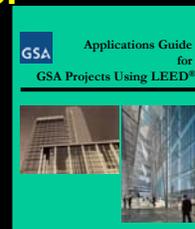
	Certified		Silver		Gold	
	1A	2A	3A	4A	5A	6A
	In Thousands					
Design Fee Premium	\$78.0	\$78.0	\$87.7	\$11.2	\$147.0	\$141.5
LEED Documentation & Certification	\$28.7	\$28.7	\$30.4	\$30.4	\$33.9	\$33.9
Soft Cost Totals	\$106.7	\$106.7	\$118.1	\$41.6	\$180.9	\$175.4
Cost Impact (\$/GSF)	\$0.35	\$0.35	\$0.38	\$0.43	\$0.59	\$0.57

GSA



LEED Applications Guide

- Pre-Design LEED Evaluation Process
- Describes Typical Credits for GSA Projects
- Identification of Credits That Are:
 - GSA Mandates (P100)
 - No Cost Premium Strategies
 - Low Cost Strategies
 - Moderate Cost Strategies
 - High Cost Strategies
- Regional/Situational Considerations
- LEED Tasks, Organized by Project Phase



GSA



Copies Available Soon Whole Building Design Guide



GSA



Program What You Want i.e. You Have to Contract/Ask for It

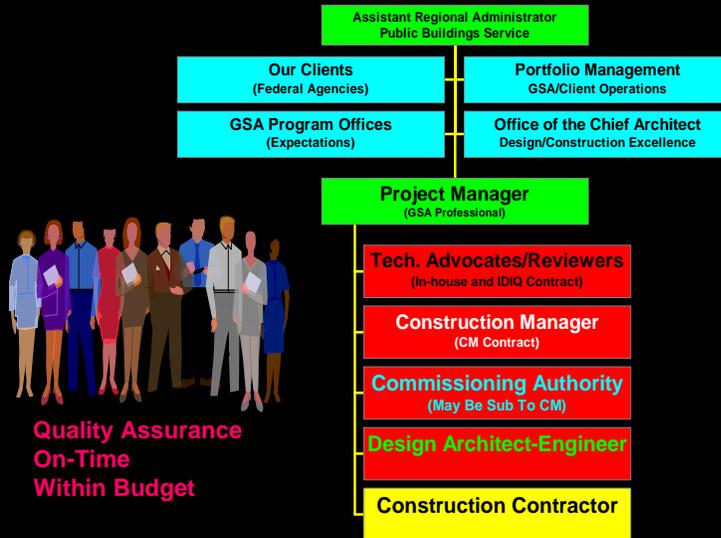
- Reference Sustainable Design Criteria
 - GSA's Facilities Standards (P-100)
 - Whole Building Design Guide
- Relate To Known Cost Premiums
 - LEED Cost Study
 - Applications Guide
- **Contract for What You Want**
 - **Program Development**
 - **Incorporate Into A-E, CM, Cx Scopes**

GSA



Contracting the Delivery Team...

Whose On Your Side?



GSA



Who Is On Your Side?

Nobody – Unless You Pay for It / Work at It

- **Program Advocate** - Assume This is You ✓
- **Project Manager** ✗

GSA



2004 Energy

Who Is On Your Side?

Nobody – Unless You Pay/Work At It

- **Program Advocate** - Assume This is You ✓
- **Project Manager** ✗
- **Architect-Engineer** ?
 - **Sustainability Consultant** - If Used ?
- **Construction Manager** ✗
 - **Commissioning Authority** ?
- **Construction Contractor** ✗
- **Client Agency** - If Tied To Productivity ?

GSA



Make Sustainability Part of the Client's Business Case

- **Explain Options in Terms They Understand**
 - Flexibility/Convenience/Reliability
 - Reduced Off-Hour Costs, vs Higher Costs
 - Comfort
 - IAQ, Health Issues (e.g. mold)
 - Productivity
- **Let the Client Know You're On Their Side**
- **Explain Benefits/Weaknesses of Options**
- **Get Them To Want Sustainability**
- **Let Them Advocate/Protect Your Ideas**

GSA



The Business Case

- **How Do I Get Everything When I Have a Limited Budget?**
 - *Program What You Want (Criteria/Cost)*
 - **Integrate Your Decisions (Go for Win-Win)**
- **How Do I Know What I Am Doing Will Really Cost Less Over The Life of the Facility**
 - *Learn From What You/Others Have Done*
 - *Life Cycle Cost Your Options (If you can)*
 - *Commissioning (Persistence, Persistence, ...)*

GSA



Integrate Your Solutions

The Business Case Must Be Made Many Times!

- **Project Management Coordination**
 - Bring Together Delivery Team and Program Advocates
 - Involve Clients/Stakeholders
 - Expect PMs To Coordinate, Not Advocate
- **Proactive Design Direction (Not Reactive)**
 - Issues/Reminders Before Each Phase
 - Tell Delivery Team What You Know/Want

GSA



Integrate Program Goals

Systems		Aesthetics	Productivity	Sustainability	Security	Seismic	Fire Safety	Accessibility	Historic Pres.	Oper. & Main.
Foundations					3					
Basement Construction				2	2	3	2			2
Superstructure		2	2	2	3	3	2	2	2	
Exterior Walls		3	2	3	3	3	2		3	2
Exterior Glazing/Doors	Windows	3	3	3	3	2	2		2	3
	Doors	2	2	2	3	2	2	3	2	2
	Special, Atria	3	2	2	3	2	3		2	3
	Coverings	2	2	2	2	2	2		2	3
Roofing		3	2	2	2	2	2		2	2
Interior Partitions/Doors		3	2	2	2	2	2		2	2
Interior Access Floors		3	3	3	2	2	2		2	2
Interior Finishes	Wall Finishes	3	3	2						3
	Floor Coverings	3	3	3						3
	Ceiling Treatments	3	3	3						2
Conveyance Systems		3	2		2	2	2	3		3
Plumbing	Fixtures	2		3		2	2	3		2
	Dist. And Drainage									2
HVAC	Central Plant	2	3	3	2	2	2			3
	Air Distribution									2
Fire Protection		2	3	3	2	2	2			3
Service & Distribution	Main Power				2	3	3			2
	Emergency Power				2	2	2			2
Light'g & Branch Wiring		3	2	2						3
Communications & Security			2	2	3	2	2			2
Equip. & Furnishings	Oper. & Maint.		3	2				2		3
	Food Services		2	2			2	2		2
	Fixed Furnishings		3	2	2			2	3	2
Special Building Const.		3	2	2	2	2	2	2	2	2
Demolition & Abatement	Bldg Elements			3					3	
	Hazard Mat.			3						
Sitework - Building Related	Site Prep.			3					2	
	Landscaping	3	2	3	2			2	2	3
	Utilities				2	3	2			2
Other Sitework - Project Related		3	2	2	2	2	2	3	2	2

Insure All Systems Support Each Goal

Insure Each System Supports All Goals

GSA



The Business Case

- How Do I Get Everything When I Have a Limited Budget?
 - *Program What You Want* (Scope/Cost)
 - *Integrate Your Decisions* (Go for Win-Win)
- **How Do I Know What I Am Doing Will Really Cost Less Over The Life of the Facility**
 - **Life Cycle Cost Your Options** (If you can)
 - **Commissioning** (Persistence, Persistence, ...)

GSA



Narrow Life Cycle Cost Opportunities

- 1 ✓ **Energy Efficiency**
(HVAC, Lighting, Envelope, BAS)
- 2 ✓ **Water Usage**
(Quantity, Purity)
- 3 ✗ **Materials/Systems**
(Recycling, Contaminants, Durability, Locally Available)
- 4 ✗ **Indoor Environment**
(IAQ, Acoustics, Odors)
- 5 ✗ **Facility Operations**
(O&M Replacements, Diagnostics, Flexibility, Access, Cleanability)
- 6 ✗ **Site and Transportation**
(Local Ecosystem, Public Transit)
- 7 ✗ **Construction**
(Packaging, Site Waste Mgt., Quality Assurance Testing and Start-up)



San Francisco Federal Building



GSA



Life Cycle Cost Your Decisions *(If you can)*

- **You Can Optimize Your Energy Decisions**
- **You Can Consider Cost Benefits of Water Conservation**
- **Must Often Use We're "Stewards of the Environment" Arguments for the Rest**

GSA



The Business Case

- How Do I Get Everything When I Have a Limited Budget?
 - *Program What You Want (Scope/Cost)*
 - *Integrate Your Decisions (Go for Win-Win)*
- **How Do I Know What I Am Doing Will Really Cost Less Over The Life of the Facility**
 - *Life Cycle Cost Your Options (If you can)*
 - **Commissioning** *(Persistence, Persistence, ...)*

GSA



Commissioning

The Business Case to Assure Delivery

- **Required On GSA Capital Construction**
 - P-100 Defined, Commissioning Guides
 - LEED Criteria Implied Market
- **Total Building Cost Impact**
 - ASHRAE, NECA, LEED, OSHA, PECL, others
- **Need Commissioning Plan**
 - Quality Assurance Roadmap
 - Historically, Developed Too Late For Professional Services Contracts
 - Time Consuming, Very Expensive

Have I Got A Deal For You!



The Commissioning Plan Tool

Lets You Generate a Commissioning Plan That Is...

- **Project Specific** (Using Project Description Inputs)
- **Identifies Each Team Member's Roles**
- **Addresses All Project Stage Tasks**
- **Satisfies LEED Commissioning Credit**
- **Scope Defining for A-E, CM, and Cx Contracts**
- **Available To Anyone**
- **Delivered In 15 Minutes, Editable**
- **Free**





Commissioning Plan Tool

The screenshot shows the homepage of the Project Planning Tools website. The browser title is "Project Planning Tools - Microsoft Internet Explorer provided by General Services Administration". The address bar shows "http://www.projectplanningtools.org". The page features the GSA logo and the text "U.S. General Services Administration". The main heading is "Project Planning Tools" with the tagline "Tools that simplify building project delivery." To the right, there is a section titled "New to the Project Planning Tools?" with a "Register Now >" link and an "Already registered? Sign in Here >" link. Below this is a large image of a modern building interior. To the right of the image is a text block describing the Project Planning Tools (PPT) Version 1.0, its benefits, and a note about programming upgrades and de-bugging. At the bottom, there is a "Comments" section with the text "PPT Training Planned for GSA Project Team Members".



Enter Your Life Story... The short version

The screenshot shows the "New Registration" page of the Project Planning Tools website. The browser title is "Create a New Registration - Project Planning Tools - Microsoft Internet Explorer provided by General Services Administration". The address bar shows "http://128.121.17.137/register.aspx". The page features the GSA logo and the text "U.S. General Services Administration". The main heading is "Project Planning Tools" with the tagline "Tools that simplify building project delivery." Below this is a "New Registration" section with a "User Profile" form. The form includes fields for First Name, Middle Name, Last Name, Organization, Address, City, State (a dropdown menu), Province (if applicable), Country (if non-U.S.), Post Code, Phone, Alternate Phone, and Fax. A green speech bubble points to the form with the text "“*” Are A Must Entry... You create Your Password...".



Identify/Describe Your Project...

The screenshot shows the 'Basic Information' tab of the Project Planning Tools interface. The form contains the following fields:

- Project Name: * Hoboken Courthouse
- Address: 1234 Main Street
- City: Hoboken

A green callout box with a speech bubble points to the 'Project Name' field, containing the text: *For new projects, describe basic information, hit "save"*



Identify Involved Systems...

The screenshot shows the 'Building Systems' tab of the Project Planning Tools interface. It features a checklist of building systems with checkboxes for selection. The systems are organized into three main columns:

- Substructure:** Foundations (Standard Foundations, Special Foundations), Basement Construction (Basement Excavation, Basement Walls, Slab on Grade).
- Superstructure:** Floor & Column Construction, Roof Construction, Slab Construction, Special Superstructure Construction.
- Exterior Walls:** Exterior Wall Construction, Special Wall Elements, Exterior Glazing & Doors (Windows, Doors, Special Glazing, Roofing, Roof Coverings & Troubleshooting, Skylights & Roof Openings).

Below these columns are sections for 'Interior Construction' (Partitions, Doors & Specialties), 'Conveyance Systems' (Conveyance Systems), and 'Mechanical' (Plumbing).

A green callout box with a speech bubble points to the 'Superstructure' section, containing the text: *Now indicate those systems that are involved with the project, and hit "save"*



Next Indicate Program Goals...

U.S. General Services Administration | Project Center | My Profile | Help | Logout

Project Planning Tools
Tools that simplify building project delivery.

Hoboken Courthouse

Project Details | Planner | Commissioning Plan | Notes

Basic Information | Building Systems | **Program Goals** | Team

Uncheck the program goals NOT applicable to your project. Click "Save" continue.

Program Goals

- Accessibility
- Aesthetics
- Fire & Life Safety
- Historic Preservation
- Maintainability
- Productivity
- Security
- Seismic Safety
- Sustainability

Save Cancel

Now indicate all program goals for the project, and hit "save"



Now Identify Your Team...

U.S. General Services Administration | Project Center | My Profile | Help | Logout

Project Planning Tools
Tools that simplify building project delivery.

Hoboken Courthouse

Basic Information | Building Systems | **Teams** | Commissioning Plan

Define your team. Enter team member information for each rule, as needed. After completion, click "Save" to view your teaming plan.

Expand all Users | Print

Name:	Org:	Phone	
Project Creator			
David Eakin	Project Admin U.S. General Services Administration	(202) 501-1726	
Architect-Engineer (AE)			Add Del
Norma Lee Overbudget	Read-only Form Over Function, Inc	norma@...	Change Access Del
Architecture/Landscape/Interiors Discipline (AL)			
Alfred E. Newman	Read-only Work for Green, Inc	anewman@green-inc	Add Del Change Access Del
Client Agency(ies) (CL)			
Beth Shearer	Editor Have Money will Travel	beth.shearer@comcast.net	Add Del Change Access Del

Finally, Enter Your Delivery Team Members, and hit "Save"

Note: Each Team Member will automatically get an E-Mail notice that they are on your project team, and your project will appear on their PPT project list



Commissioning Plan, Shazam!

All Commissioning Plan content is editable! Just click on a tab and change/add/delete what you want...

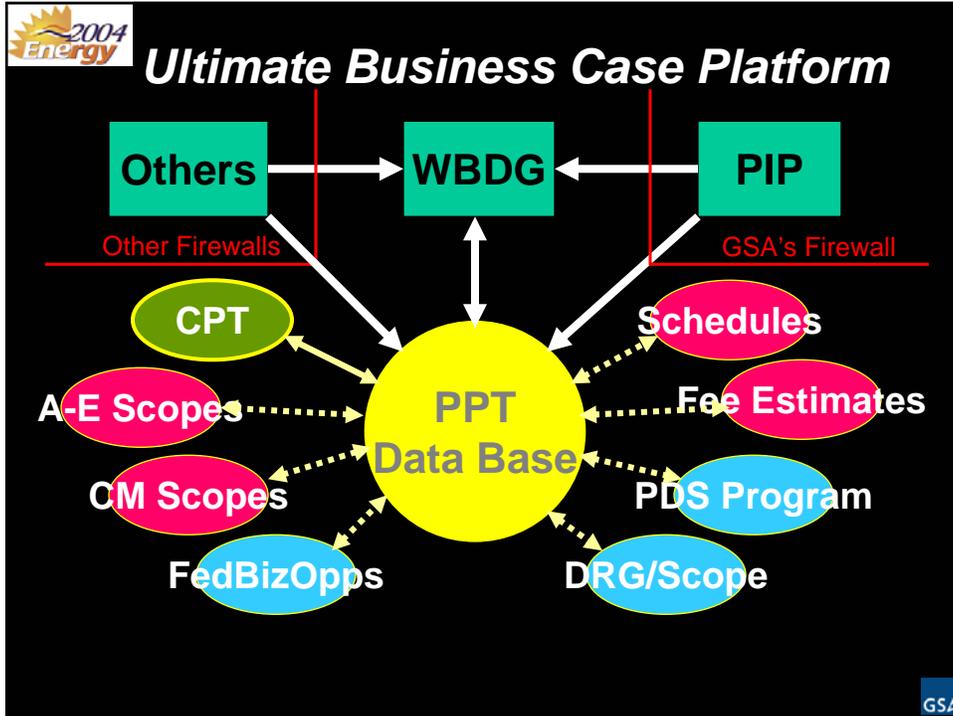
A Commissioning Plan now exists for your project, divided into tab sections A-J. Hit blue bar to print...



The Ultimate Scope Tool

Note responsibility codes beside each task

The ultimate Scope of Work for Contractors, the ultimate communications guide for clients and staff...



- 2004 Energy
- ## Delivery Paradigms
- Identify Need
 - Develop Criteria Doc
 - Comments/Resolution
 - Print/Issue Doc
 - Follow-up Guide(s)
 - User Inquiries
 - Training
 - Delivery Doc Prepared
 - User Modifies Practice
 - Find Out Year(s) Later
 - Develop New Criteria
- GSA



Delivery Paradigms

Old

- Identify Need
- Develop Criteria Doc
- Comments/Resolution
- Print/Issue Doc
- Follow-up Guide(s)
- User Inquiries
- Training
- Delivery Doc Issued
- User Modifies Practice
- Find Out Year(s) Later
- Develop New Criteria

New

- Identify Need
- Reflect In Database
- Delivery Doc Prepared
- Automatic Feedback
- Change Database

GSA



Close The Business Case

- Program Your Requirements
 - Use Sustainable Criteria, WBDG
 - Define The Budget – Pay the Price
- Define Business Case Arguments
 - LCC for Some Sustainable Issues
 - Cultivate Project Team Alliances
- Contract For It
 - If You Don't Pursue It, You Won't Get It
 - The PPT Is There To Help

GSA