



***Federal Data Center Consolidation Initiative  
(FDCCI)***

***Workshop III: Final Data Center Consolidation Plan***

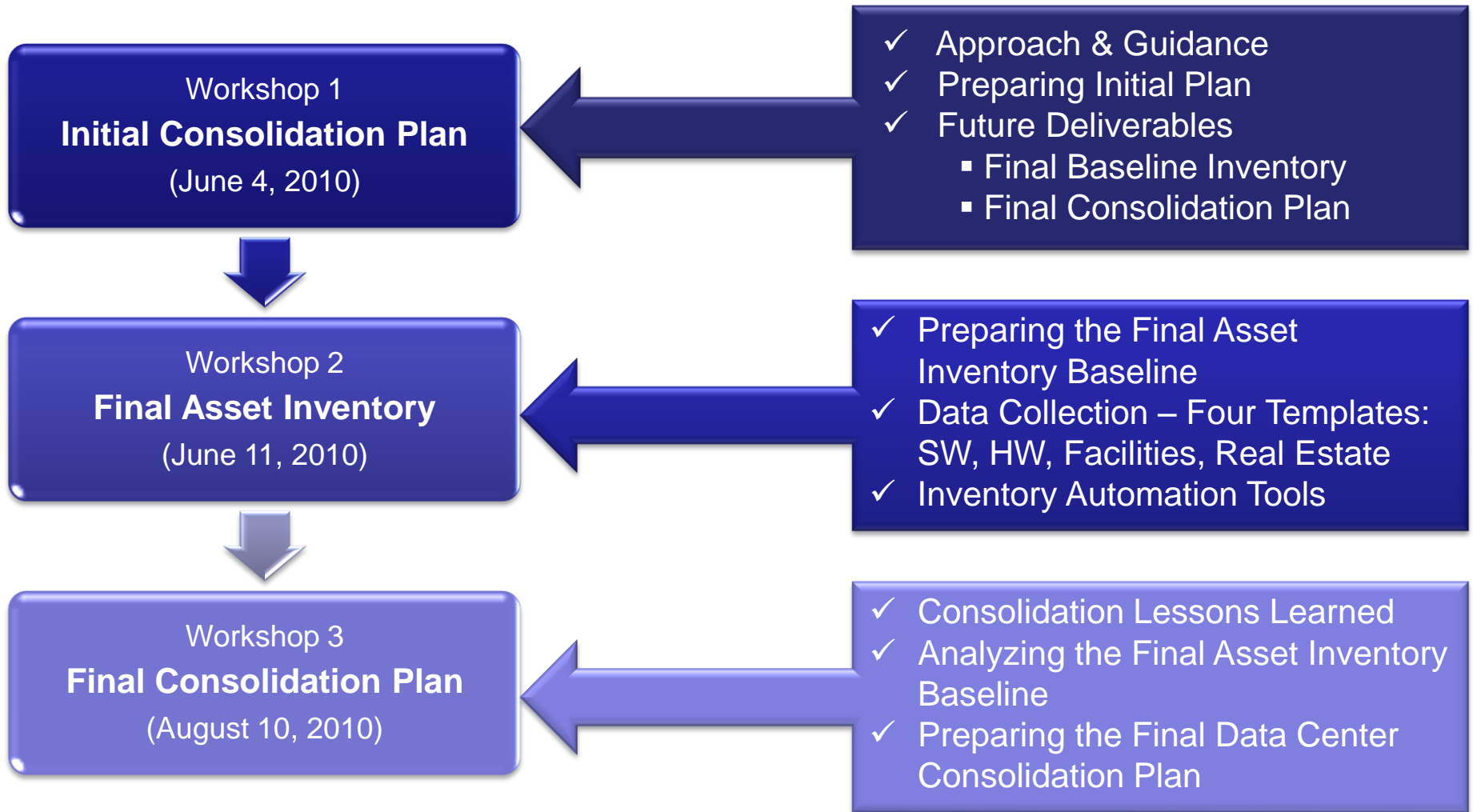
August 10, 2010

- |  |  |                |
|--|--|----------------|
| <b>1. Welcome</b>  | <b>Katie Lewin – GSA</b><br>Director Cloud Computing Program     | <b>10 min.</b> |
| <b>2. Data Center Consolidation</b><br>Trends and Best Practices | <b>Bill Malick – Gartner</b>                                     | <b>35 min.</b> |
| <b>3. Data Center Consolidation Plan</b><br>Best Practices       | <b>Thomas Meerholz</b><br><b>Department of Commerce</b>          | <b>25 min.</b> |
| <b>4. Final Asset Inventory Baseline</b><br>Initial Findings     | <b>Zachary Baldwin – GSA</b><br>IT Specialist, Policy & Planning | <b>10 min.</b> |
| <b>5. Final Consolidation Plan</b><br>Guidance                   | <b>Nikolay Bakaltchev</b><br>GSA PMO Team                        | <b>25 min.</b> |
| <b>6. Next Steps &amp; Questions</b><br>OMB feedback to Agencies | <b>OMB &amp; GSA PMO Team</b>                                    | <b>30 min.</b> |

## 1. Welcome

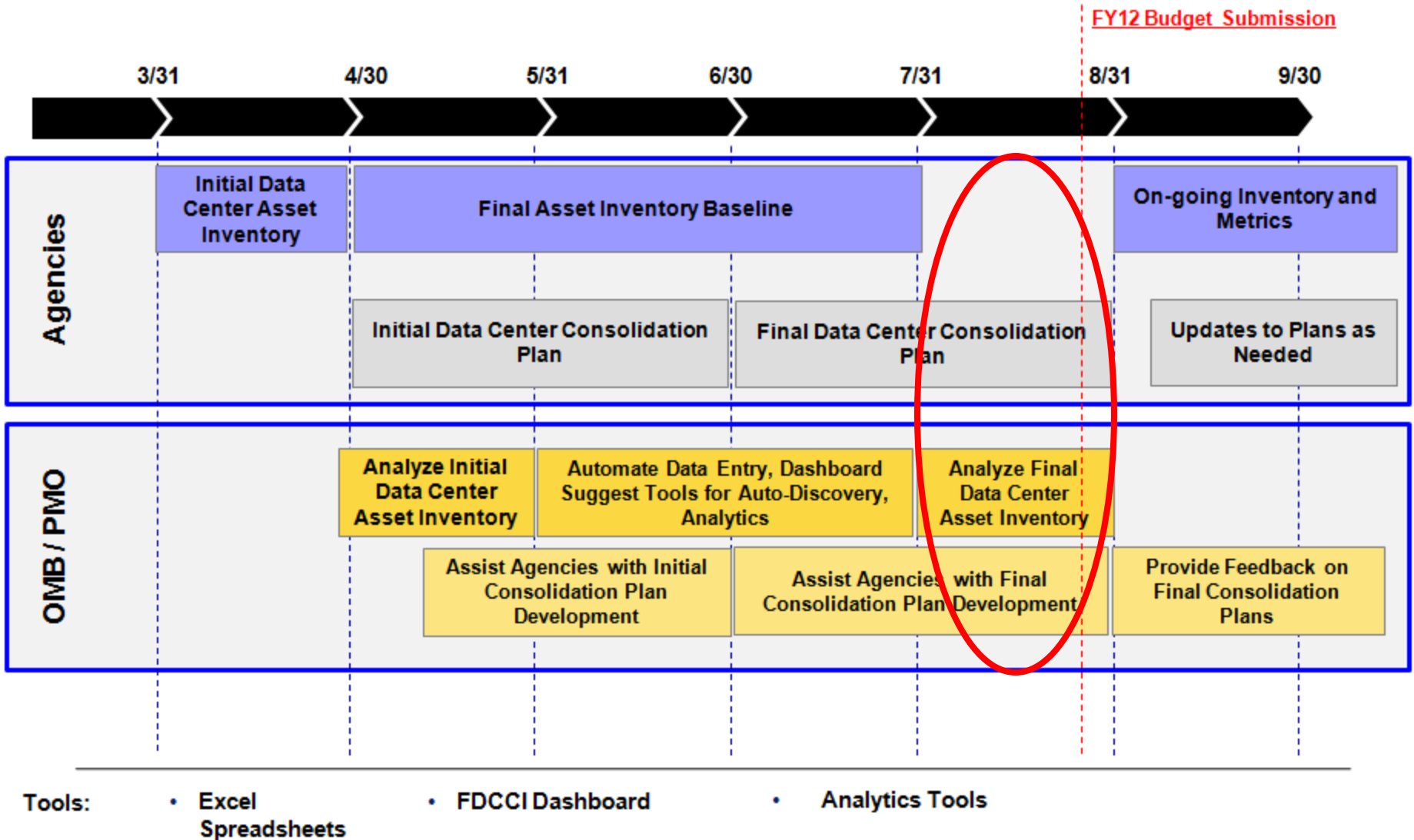
**Katie Lewin – GSA**

Director Cloud Computing Program



Deliverables	Agency Task	Agency Deadlines	FDCCI PMO Task	PMO Deadlines
1. INITIAL ASSET INVENTORY	Conduct an initial inventory of data center assets.	April 30, 2010 (Completed)	<ul style="list-style-type: none"> <li>Assist Agencies with the analysis and comparison of data center count, rack and server count, and supported Major Systems across the Federal Government; Identify potential areas of asset consolidation, reuse and cost savings.</li> </ul>	May 31, 2010 (Completed)
2. INITIAL DATA CENTER CONSOLIDATION PLAN	Develop an initial data center consolidation plan.	June 30, 2010 (Completed)	<ul style="list-style-type: none"> <li>Assist Agencies in identifying and proposing potential areas where optimization through server virtualization or cloud computing alternatives may be used and offer a high-level transitioning roadmap.</li> </ul>	July 30, 2010 (Completed)
3. FINAL ASSET INVENTORY BASELINE	Collect the final asset inventory baseline containing more detailed data.	July 30, 2010 (Completed)	<ul style="list-style-type: none"> <li>Analyze detailed utilization patterns and virtualization and cost savings opportunities. This will serve as the foundation for the final data center consolidation plans.</li> </ul>	Aug 30, 2010 (Completed)
4. FINAL DATA CENTER CONSOLIDATION PLANS	Develop final data center consolidation plans. <b>Reflect data center consolidation plans in FY12 budget.</b>	Aug. 30, 2010	<ul style="list-style-type: none"> <li>Evaluate and provide guidance and feedback on technical roadmap and approach for achieving the targets for infrastructure utilization, rack density and consolidation.</li> </ul>	Nov 30, 2010
5. ONGOING MONITORING	Conduct ongoing annual monitoring, reporting starting in FY11. <b>Reflect data center consolidation plans in next FY budget.</b>	June 30, 2011 Sept. 30, 2011	<ul style="list-style-type: none"> <li>Maintain and analyze updated asset inventory annually (FYQ3)</li> <li>Consolidate reporting on FDCCI progress (FYQ4)</li> </ul>	Sept 30, 2011 Dec 31, 2011

# Timeline for FDCCI



## **2. Data Center Consolidation**

### Trends and Best Practices

**Bill Malick**

Research Director, Gartner

## **3. Initial Consolidation Plan**

Lessons Learned

**Thomas Meerholz**

Department of Commerce



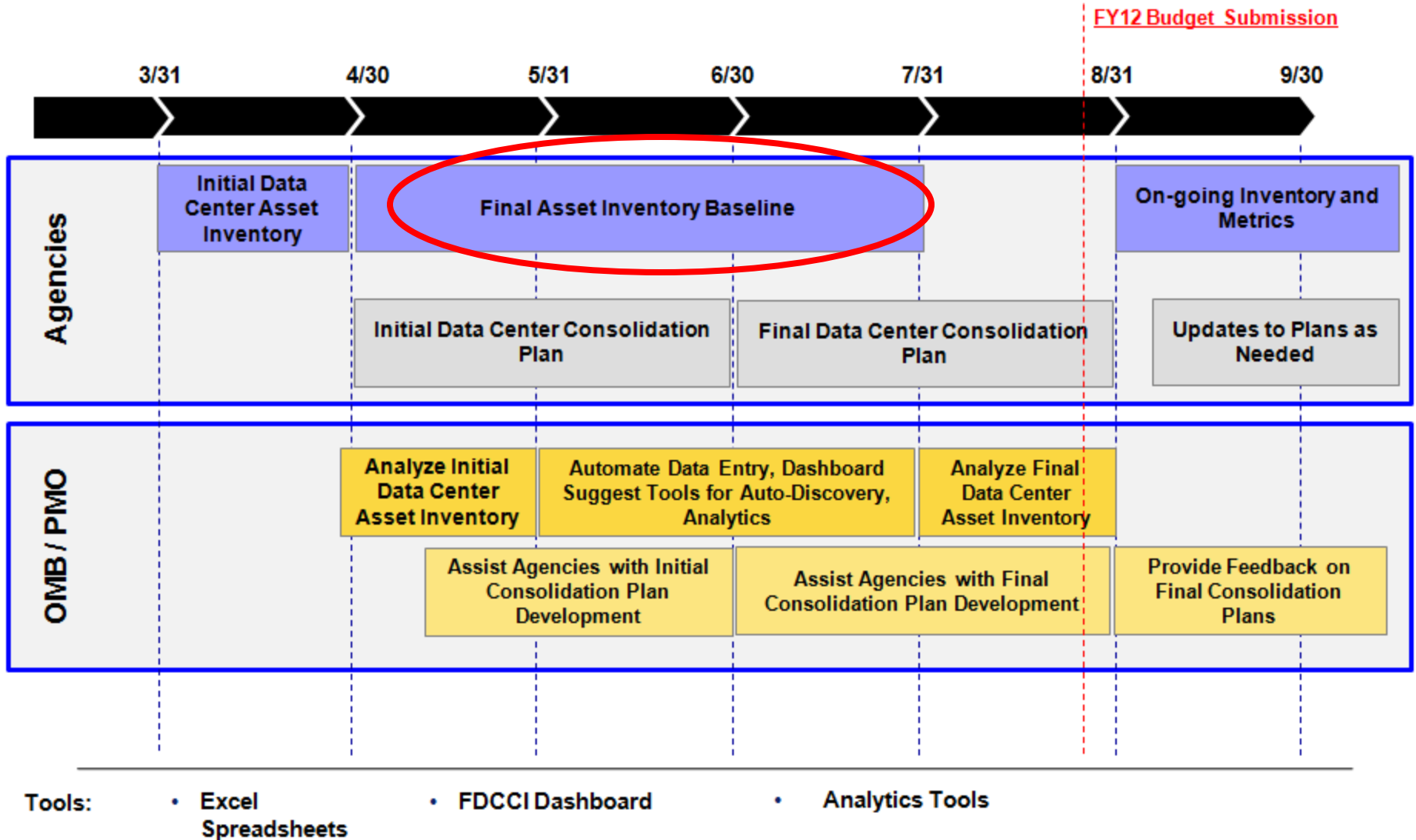
## 4. Final Asset Inventory Baseline

Initial Findings

**Zachary Baldwin – GSA**

IT Specialist, Policy & Planning

# Final Asset Inventory Submitted on July 30

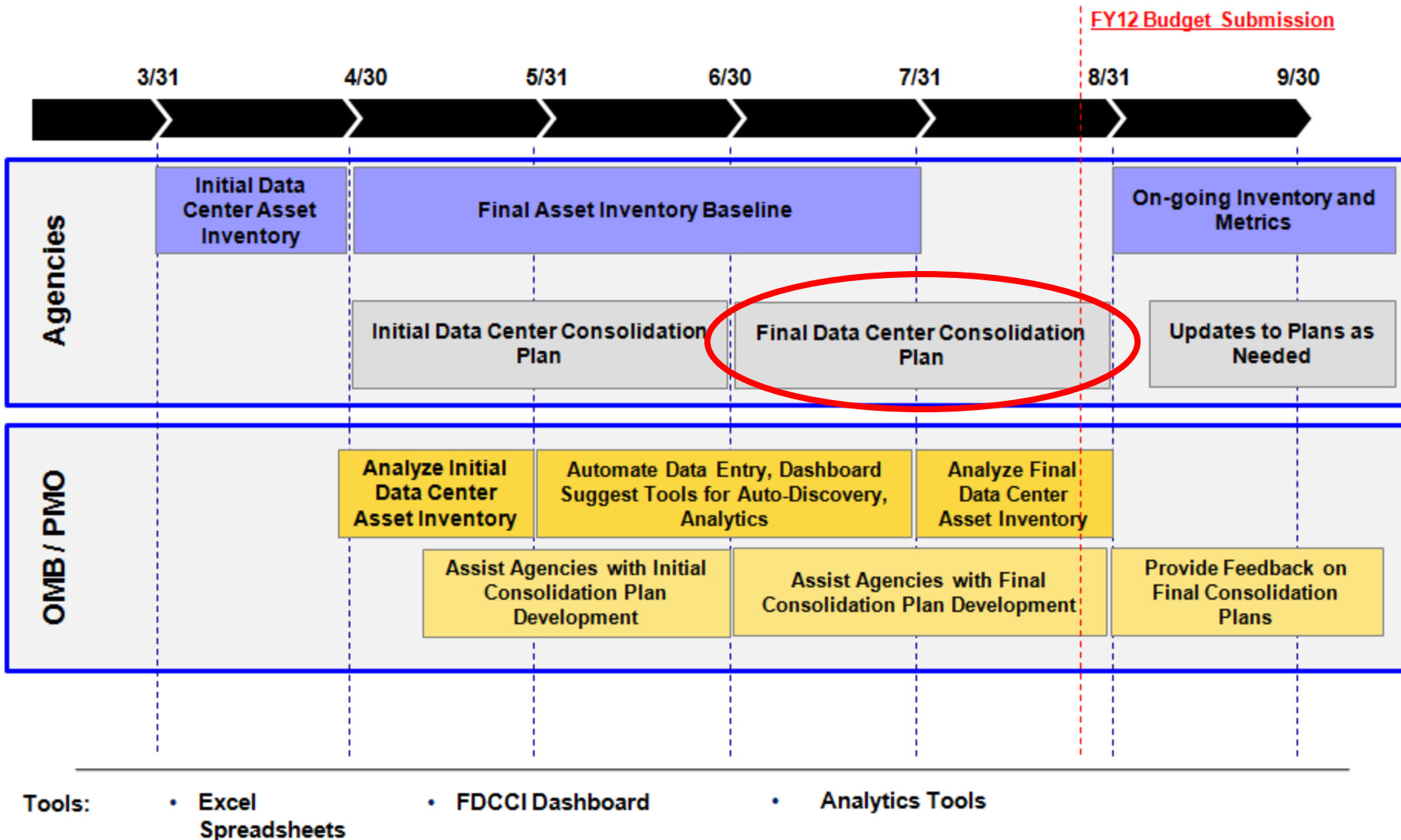


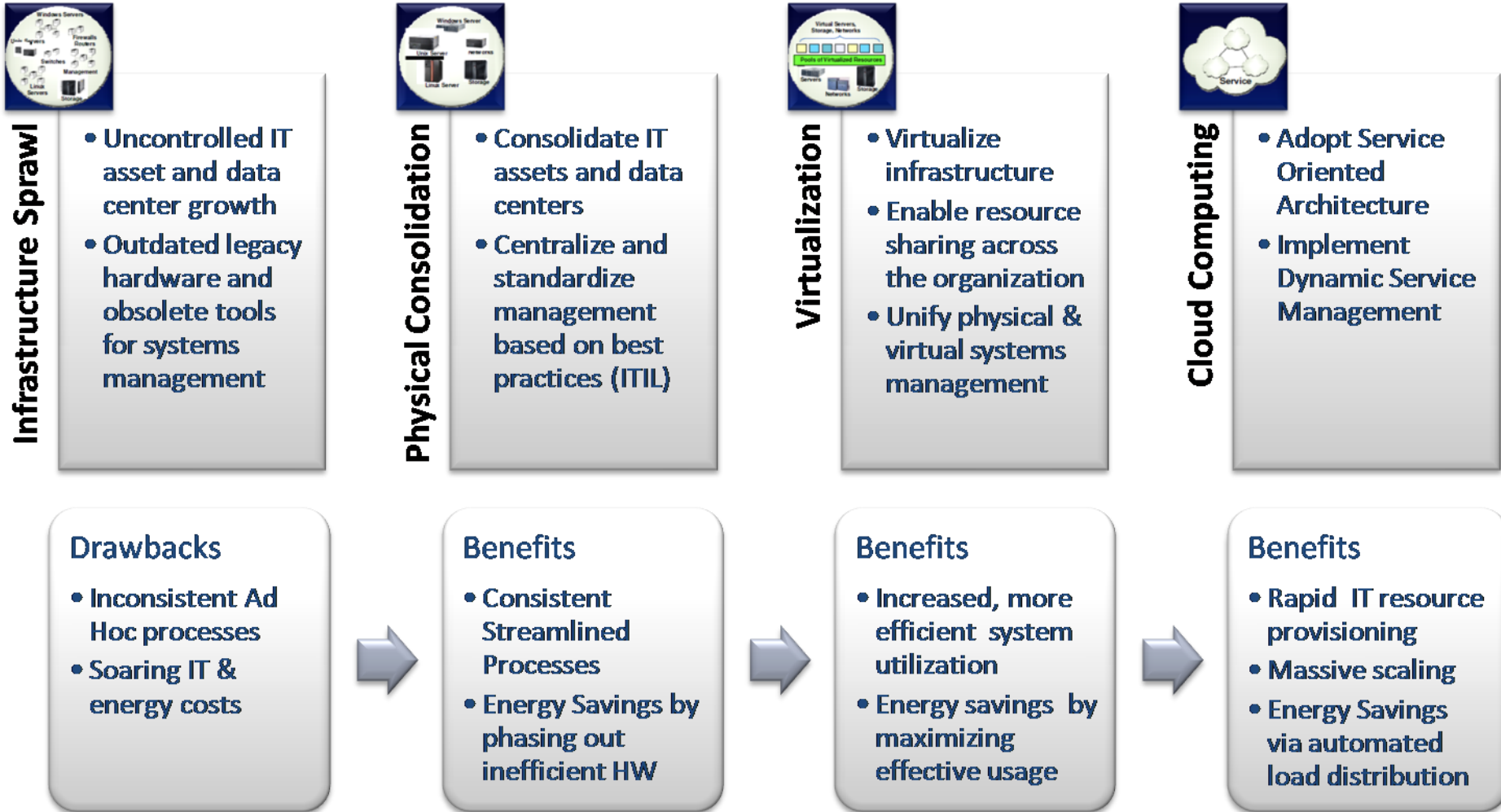
## **5. Final Consolidation Plan**

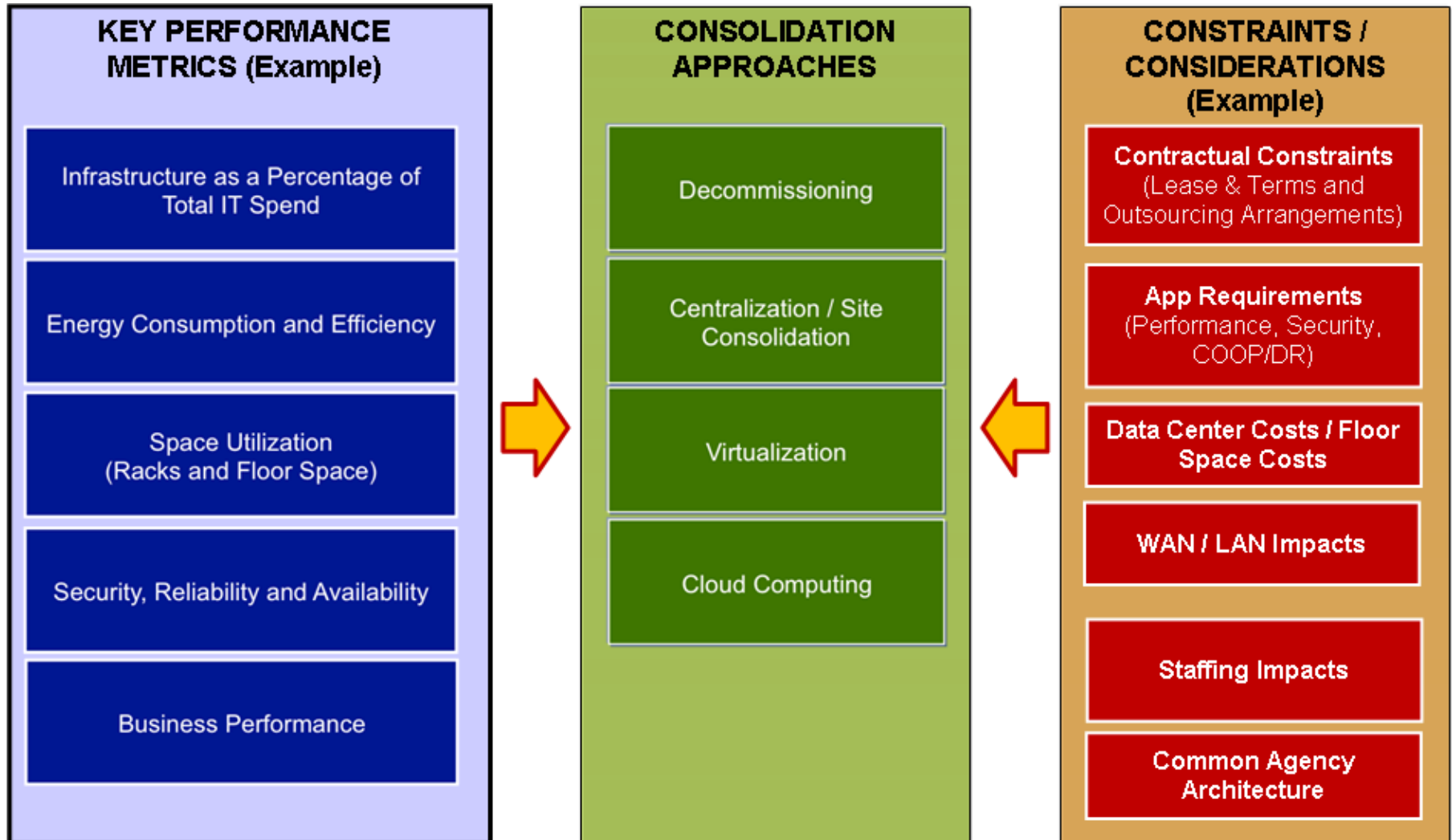
Guidance

**Nikolay Bakaltchev – GSA PMO Team**

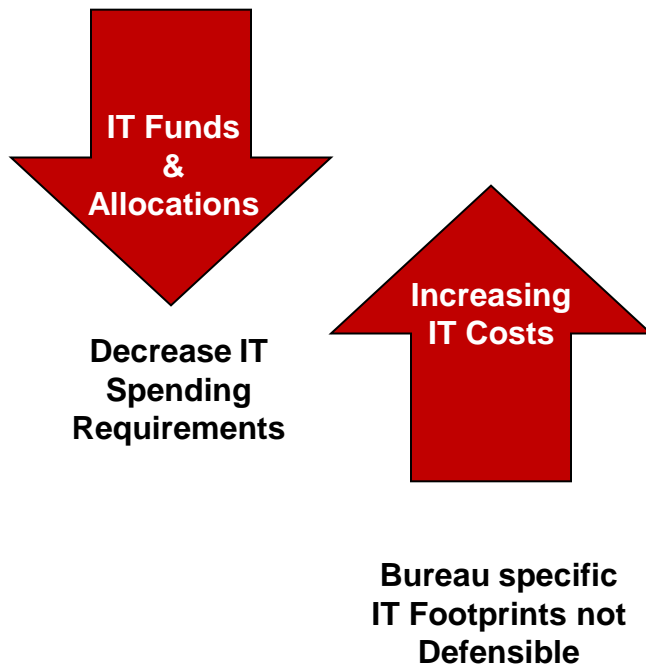
# Final Consolidation Plan Due on August 30







## Agency Drivers for Data Center Consolidation:

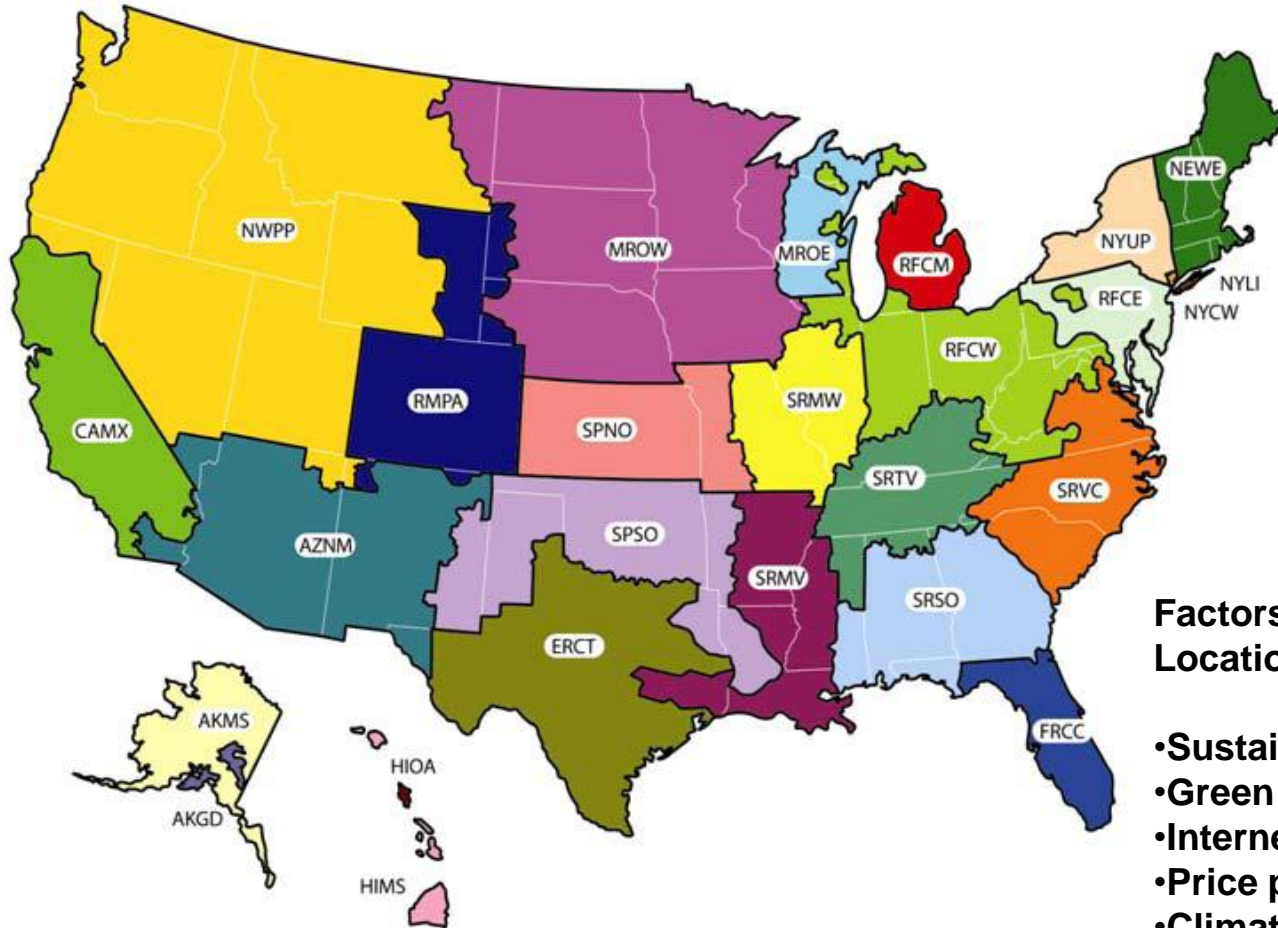


**Bureau specific IT footprints with increasing costs are not defensible when reasonable rational exists**

**To make funds available for value add applications, the percentage of IT spending devoted to infrastructure must decrease**

**Valid commercial options exist to reduce costs while still supporting Agency missions**

## EPA eGRID Subregions



### Factors to Consider When Choosing Location and Real Estate:

- Sustainable Energy Sources
- Green House Gas (GHG) Emissions
- Internet Hub Access
- Price per Square Foot
- Climate Zone - Median Temperature

Source: [www.epa.gov/cleanenergy/egrid](http://www.epa.gov/cleanenergy/egrid)



The Final Consolidation Plan shall consist of the following sections:

Section	Length
1. Introduction	1 Page
2. Agency Goals for Data Center Consolidation	1 Page
3. Implementing Shared Services / Multi-tenancy	1-2 Pages
4. Agency Approach, Rationale, and Timeline	2-3 Pages
<b>5. Agency Governance Framework for Data Center Consolidation</b> 5.1 Cost-benefit Analysis 5.2 Risk Management and Mitigation 5.3 Acquisition Management 5.4 Communications Strategy	½-1 Pages ½-1 Pages ½-1 Pages ½-1 Pages ½-1 Pages
<b>6. Appendix – FDCCI Templates</b> 6.1 Appendix A: Agency-level Summary of Final Asset Inventory Baseline 6.2 Appendix B: Final Data Center Consolidation Plan Templates	<b>Excel Templates</b>

## 1. The Introduction

- *Limit to 1 page*
- The introduction should consider the following factors:
  - Downward pressure on Federal agency spending will continue as part of deficit reduction efforts.
  - Bureau-specific, agency component-specific, and program-specific data center footprints with increasing space allocations, energy costs, and real estate costs are not defensible when reasonable rational exists.
  - If agencies require additional expenditures as part of the consolidation efforts, these costs should be offset by corresponding reductions in infrastructure, real property, personnel, and energy.
  - Alternatives to in-house implementation, including valid commercial options to reduce costs of IT services without affecting bureau missions (IaaS, PaaS, and/or SaaS).
  - If “in-house” solutions are needed to meet performance or security requirements, the agencies should maximize Department-wide services, interagency sharing, co-location and virtualization.
- This introduction should highlight agency high level business needs that will be addressed as part of this undertaking.

## 2. Agency Goals for Data Center Consolidation

- *Limit to 1 page*
- This section should include business related goals and specific and measurable objectives
- Examples of business related goals
  - Improved Performance, Reliability, and Availability
  - Increased security
  - Improved Data Management (Ability to use and share info)
  - Greater Cost Efficiency
- Examples of measurable objectives include
  - Eliminating bureau-specific “data centers” within (#) years (Exceptions: application / system performance requirements; information security requirements);
  - Implementing Shared Services (either government or commercial) within (#) years for:
  - Achieving optimal virtualization and utilization levels (servers, storage, desktops/workstations).

# Preparing the Initial Plan – Goals & Objectives (Examples)

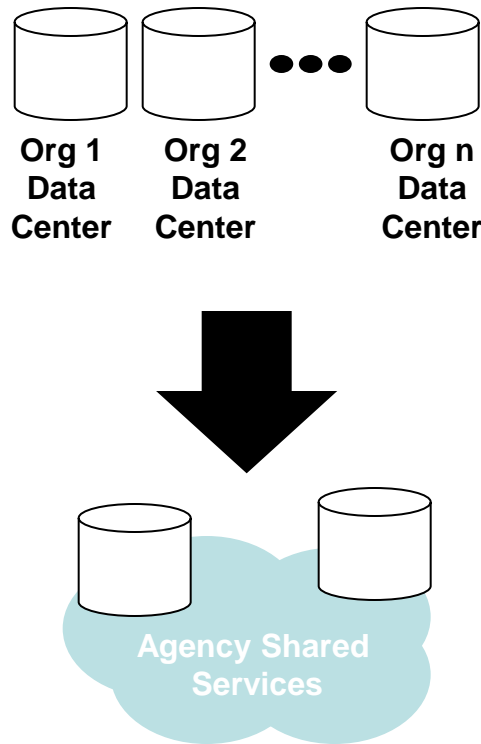
## Agency Goals:



Agency Goals will help drive the approach for:

- Developing approaches
- Evaluating rational

## Agency Objectives:



The Agency Objectives are more specific and provide a foundation for the consolidation approach.

## Potential Agency Goals:

**Eliminate silo'd Data Centers**

**Implement Shared Services (either govt. or commercial):**

- WAN and Internet access
- Identity and Access Management
- Email / Collaboration
- Public Web Sites
- All Administrative Support Applications (such as financial management, HR, procurement)

**Achieve Maximum virtualization**

- Servers and storage, desktops/ workstations )

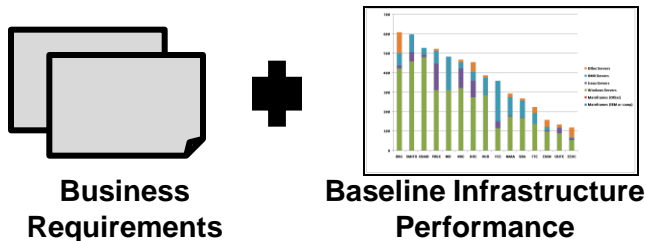
## 3. Implementing Shared Services / Multi-tenancy

- *Limit to 1-2 pages*
- Examples of potential shared services include:
  - WAN Management
  - LAN Management
  - Help Desk Services
  - Cyber Security Services
  - Data Privacy Services
  - Identity and Access Management Services
  - IT Inventory and Asset Management Services
  - Server and Application Hosting Website Hosting
  - Collaboration Tools
  - Email Services
  - Electronic Records Management Services
  - Business Support Services (e.g., HR, Payroll, Acquisition, Budget)
  - Video Teleconferencing Services
  - Telephone Services
- Department/agency plans should address how target shared services will be acquired/provisioned and whether your agency intends to acquire/provide services to other agencies.

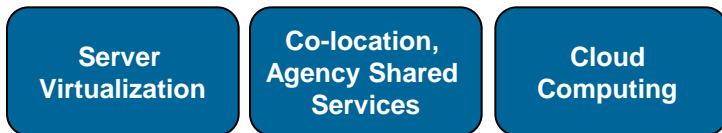
## 4. Agency Approach, Rationale, and Timeline

- *Limit to 2-3 pages*
- Explain how the approach correlates to goals and achieves the objectives.
- Explain how the approach fits within the agency’s strategic IT goals.
- Include a rationale that supports each approach to be employed.
- Identify Constraints and Considerations that affect each approach and the impact related to the agency’s mission and future strategic IT goals.

Assessment



Alternatives



### Agency Opportunities for Achieving Consolidation:

**Assessment of Requirements and Baseline Performance will highlight opportunities for both shared services and potential optimization**

**Specific baseline infrastructure performance metrics may consider Server Utilization, Power Usage Efficiency, and Rack Space Utilization**

**Opportunities for reducing IT spending, especially infrastructure, can be found in regard to space, energy, equipment, software, personnel through “Alternatives”**

Approach	Description	Potential Benefits	Rationale
Decommission	Turn off servers that are not being used or used infrequently (e.g. dedicated development environments)	<ul style="list-style-type: none"> <li>• Cost Savings</li> <li>• Energy Efficiency</li> <li>• Frees Floor / Rack Space</li> </ul>	<ul style="list-style-type: none"> <li>• As many as 10-15% of servers may be inactive but still powered on in data centers*</li> </ul>
Centralization / Site Consolidation	<p>Move servers/storage to a few selected data centers</p> <p>Consolidate small data centers to larger target centers</p>	<ul style="list-style-type: none"> <li>• Floor Space Cost Savings</li> <li>• Operational Cost Savings</li> <li>• Increase Rack Utilization</li> <li>• Energy Efficiency</li> </ul>	<ul style="list-style-type: none"> <li>• Approximately 430 Government data centers are categorized as "closets" or small sized data centers (less than 1,000)**</li> </ul>
Virtualization	Consolidate several servers onto a single server through virtualization of the OS/Platform	<ul style="list-style-type: none"> <li>• Floor Space Cost Savings</li> <li>• Increase Rack Utilization</li> <li>• Increase Server Utilization</li> <li>• Energy Efficiency</li> </ul>	<ul style="list-style-type: none"> <li>• Server Utilization is approximately 21% Government wide**</li> </ul>
Cloud Computing	Move application functions to standard, vendor supported enterprise platforms or services	<ul style="list-style-type: none"> <li>• Floor Space Cost Savings</li> <li>• Energy Efficiency</li> <li>• Operational Cost Savings</li> <li>• Cap Ex Cost Savings HW/SW</li> <li>• Reduced SW Maintenance</li> <li>• Improved Service Delivery</li> </ul>	<ul style="list-style-type: none"> <li>• Reduce Operational Risk, lower TCO</li> <li>• Approximately 40% of Civilian Agency Systems are low-impact FISMA security, and therefore may be low-risk candidates for Cloud Computing solutions</li> </ul>

\* McKinsey Report: Revolutionizing Data Center Efficiency, July 2008

\*\* OMB BDR 09-41 Data Analysis, October, 2009

## 5. Agency Governance Framework for Data Center Consolidation

- *Limit to ½-1 page*
- Describe the governance and oversight that will measure and manage performance and risk.
- Identify benchmarking measurements that will create transparency in performance measurements.
- Identify any advisory boards that will be created or used.
- Identify the key project stakeholders, the project management and any other plan governance including:
  - Change Management Plan
  - Risk Mitigation Plan
  - Spending Plan
  - Communications Plan



## 5.1 Cost-benefit Analysis

- *Limit to ½-1 page*
- All sources for cost savings should be included. For example:
  - Consolidation and/or elimination of data center facilities.
  - Multiple agency tenancy at one or more data center facilities.
  - Consolidation, reduction, or elimination of wide area network circuits (voice, data, and video).
  - Consolidation, reduction, or elimination of local area network circuits (voice, data, and video).
  - Implementation and/or expansion of green computing concepts to save energy and lower utility costs.
  - Implementation and/or expansion of cloud computing services (SaaS, PaaS, or IaaS) to lower delivery costs.
  - Application virtualization and corresponding reductions in host servers.
  - Consolidation of intra-campus cable plants for telephone and data.
  - Reduction in Help Desk and IT Asset Management service costs through consolidation.

## 5.2 Risk Management and Mitigation

- *Limit to ½-1 page*
- Risks need to be tracked at three levels:
  - Program level risks;
  - Component /system level risks; and
  - Data center level risks.
- Program level risks and any critical component and system level risks need to be reported to IT management.
- A risk management plan needs to be developed and risks need to be tracked using templates.

## 5.3 Acquisition Management

- *Limit to ½-1 page*
- The FDCCI-related acquisition strategy and all contracting actions necessary to execute the allocated budget should be identified and scheduled. In addition vendor management activity needs to be identified as part of the acquisition strategy.
- Leveraging of Agency-wide acquisition vehicles, negotiated by individual Components / Bureaus need to be considered.
- Leveraging of government-wide acquisition vehicles, negotiated by the appropriate Agencies need to be considered, e.g.:
  - Apps.gov;
  - GSA Advantage;
  - GSA Smart Buy.

## 5.4 Communications Strategy

- Depending on the scope and impact of the consolidation plan, an agency should consider developing a communications plan for the FDCCI implementation.
- Issues to consider in this communications plan include:
  - key internal and external stakeholder needs/concerns;
  - senior leadership briefing reports;
  - regular coordination (teleconferences / meetings) with key parties involved in DCCI plan implementation, e.g.:
    - end users;
    - support teams;
    - contractors;
    - IT Infrastructure teams;
    - facilities teams;
    - IT and Agency leadership teams.

## Key Performance Metrics (Sample)

**Infrastructure as a Percentage of Total IT Spend**

**Energy Consumption and Efficiency**

**Space Utilization (Racks and Floor Space)**

**Security, Reliability and Availability**

**Business Performance**

### Implications to Data Center Consolidation:

Lower cost infrastructure solutions must be considered to address Agency-wide demand for computing resources

Understand PUE and Energy Consumption across Data Centers

Higher Tier + High Square Footage Centers provide improved economics for operations at high reliability

Future state of IT Infrastructure should offer improved service performance through shared services

Focus on improving time to market, quality of services and ability to innovate to support strategic initiatives.

### Approach:

Target Centers with Low Server Utilization and High Server Capacity as “recipient” Data Centers  
Determine feasible alternatives including Cloud Computing

Perform Analysis of Server Consolidation which Targets Energy Efficiency and Not Just Costs

Consolidate Low Square Footage / Low Tier Class Centers into High Square Footage with High Tier Class

Target applications that are shared across the Agency and can offer improved operations through centralization

Identify technology to allow for on-demand provisioning of services, to allow Agency to focus on services and not infrastructure

- The Agency-level Projected Cost Savings Metrics are based on the Agency's Asset Inventory Baseline analysis and capture several metrics:
  - Data Center Count Reduction;
  - Gross Floor Area Reduction;
  - Rack and Server Count Reduction;
  - Energy Usage and Cost Reduction.

Savings Metrics	Planned Program Cost Savings by 4Q15
Data Center Count Reduction (#)	
Gross Floor Area Reduction (sq.ft.)	
Rack Count Reduction (#)	
Server Count Reduction (#)	
Mainframes (IBM or compatible) Reduction (#)	
Mainframes (Other) Reduction (#)	
Windows Servers Reduction (#)	
Linux Servers Reduction (#)	
UNIX Servers Reduction (#)	
Other Servers Reduction (#)	
Energy Usage Reduction (kW)	
Energy Cost Reduction (\$)	

- ▶ **Improving IT asset utilization is the key driver for reducing energy consumption per unit of performance. This can be achieved primarily by:**
  - Server Virtualization (increasing the number of virtual servers per hosts)
  - Server Consolidation (decommissioning underutilized physical servers)
  - Rack Space Consolidation (relocating underutilized racks)
  - Data Center Consolidation (shutting down underutilized facilities)

Utilization Metrics	Typical Results	Target Results
Average Virtualization (%)	0-10%	30-40%
Average Virtual OS per Host (#)	5-10	15-20
Average Server Utilization (%)	7 – 15%	<b>60 – 70%</b> <i>(application dependent)</i>
Average Rack Space Utilization (%)	50 – 60 %	<b>80 – 90%</b>
Average Power Density Usage Equivalent (W/sq.ft.)	50 – 100 W/Sq Ft	<b>150 – 250 W/Sq Ft</b>
Power Usage Efficiency (PUE)	3 – 2	<b>1.6 – 1.3</b>

# Initial vs. Final Consolidation Plan

## Asset Count & Savings Metrics

Savings Metrics	Planned Program Cost Savings by 4Q12
Data Center Count Reduction (#)	
Gross Floor Area Reduction (sq.ft.)	
Rack Count Reduction (#)	
Server Count Reduction (#)	
Mainframes (IBM or compatible) Reduction (#)	
Mainframes (Other) Reduction (#)	
Windows Servers Reduction (#)	
Linux Servers Reduction (#)	
UNIX Servers Reduction (#)	
Other Servers Reduction (#)	
Energy Usage Reduction (kW)	
Energy Cost Reduction (\$)	

Initial Analysis

Agency-Wide Savings Plan						
Department Name	Department ABC					
Agency Name	ABC Agency Name					
	Calculated from Baseline 4Q10	Target				
		4Q11	4Q12	4Q13	4Q14	4Q15
Tier I-IV Data Centers: Total Number of Data Centers (#)						
Tier I-IV Data Centers: Aggregate Gross Floor Area (sq.ft.)						
Server Rooms/Closets/NA: Total Number of Data Centers (#)						
Server Rooms/Closets/NA: Aggregate Gross Floor Area (sq.ft.)						
Total Number of Racks (#)						
Total Number of Physical Servers by Type (#)						
Mainframes (IBM or compatible)						
Mainframes (Other)						
Windows Servers						
Linux Servers						
UNIX Servers						
Other Servers						
Aggregate Data Center Energy Usage (kWh/year)						
Aggregate Data Center Energy Costs (\$/year)						
Aggregate Data Center Building Operational Cost (\$/year)						
Aggregate FY Construction, Expansion, Consolidation Budget (\$/year)						

## Utilization Metrics

Utilization Metrics	Typical Results	Target Results
Average Virtualization (%)	0-10%	30-40%
Average Virtual OS per Host (#)	5-10	15-20
Average Server Utilization (%)	7 - 15%	60 - 70% <i>(application dependent)</i>
Average Rack Space Utilization (%)	50 - 60 %	80 - 90%
Average Power Density Usage Equivalent (W/sq.ft.)	50 - 100 W/Sq Ft	150 - 250 W/Sq Ft
Power Usage Efficiency (PUE)	3 - 2	1.6 - 1.3

Final Analysis

Agency-Wide Utilization Plan						
Department Name	Department ABC					
Agency Name	ABC Agency Name					
	Calculated from Baseline 4Q10	Target				
		4Q11	4Q12	4Q13	4Q14	4Q15
Average Virtualization (%) (Virtual Host Count / Total)						
Mainframes (IBM or compatible)						
Mainframes (Other)						
Windows Servers						
Linux Servers						
UNIX Servers						
Other Servers						
Average Number of VMs per Virtual Host (#)						
Mainframes (IBM or compatible)						
Mainframes (Other)						
Windows Servers						
Linux Servers						
UNIX Servers						
Other Servers						
Average Physical Server Utilization (%)						
Mainframes (IBM or compatible)						
Mainframes (Other)						
Windows Servers						
Linux Servers						
UNIX Servers						
Other Servers						
Average Power Usage Efficiency (PUE)						
Average Rack Space Utilization (%)						
Average Rack Floor Utilization (%)						
Average Power Density Capacity Equivalent (W/sq.ft.)						



# Appendix A: Agency-level Summary of Final Asset Inventory Baseline (Excel Templates)

IT Software							
Department / Agency Name	Major or Non-Major Investments (Systems)	Support Platforms (TRM: 865, 866)		Servers / Computers (TRM: 877)		Consolidation Approach (enter value 1-5)	Consolidation Approach - Values (1-5)
		Vendor	Product	Vendor	Product		
Department ABC							1: Not Applicable
Department ABC							2: Decommissioning
Department ABC							3: Consolidation
Department ABC							4: Virtualization
Department ABC							5: Cloud Computing

Department / Agency Name	Department ABC
<b>IT Facilities, Energy</b>	
FY2010 Construction, Expansion, Consolidation Budget (\$/year)	
Annual Data Center Building Operational Cost (\$/year)	
Annual Data Center Electricity Cost (\$/year)	
Annual Total Electricity Usage (kWh/year)	
Annual IT Electricity Usage (kWh/year) - Measured at the output of the UPS meter, or if not available - at the PDU meter	
Total Data Center IT Power Capacity (kW)	
Rack Count (#)	
Rack Space Utilization (%) - Estimated	
<b>Centralized Network Storage</b>	
DAS (Direct Attached Storage) - Total (TB)	
DAS (Direct Attached Storage) - Used (TB)	
NAS (Network Attached Storage) - Total (TB)	
NAS (Network Attached Storage) - Used (TB)	
SAN (Storage Area Network) - Total (TB)	
SAN (Storage Area Network) - Used (TB)	

IT Hardware						
Department / Agency Name	Server Types	Physical Servers			Virtualization	
		Total Physical Server Count (#)	Max Server Utilization (%)	Average Server Utilization (%)	Total Virtual Host Count (#)	Total Virtual OS Count (#)
Department ABC	Mainframes (IBM or compatible)					
Department ABC	Mainframes (Other)					
Department ABC	Windows Servers					
Department ABC	Linux Servers					
Department ABC	UNIX Servers					
Department ABC	Other Servers					

Department / Agency Name	Department ABC
<b>Location and Real Estate</b>	
Tier I-IV Data Centers: Total Number of Data Centers (#)	
Tier I-IV Data Centers: Aggregate Gross Floor Area (sq.ft.)	
Server Rooms/Closets/NA: Total Number of Data Centers (#)	
Server Rooms/Closets/NA: Aggregate Gross Floor Area (sq.ft.)	

# Appendix B: Final Consolidation Plan – Savings Template

Agency-Wide Savings Plan						
Department Name	Department ABC					
Agency Name	ABC Agency Name					
	Calculated from Baseline	Target				
	4Q10	4Q11	4Q12	4Q13	4Q14	4Q15
Tier I-IV Data Centers: Total Number of Data Centers (#)						
Tier I-IV Data Centers: Aggregate Gross Floor Area (sq.ft.)						
Server Rooms/Closets/NA: Total Number of Data Centers (#)						
Server Rooms/Closets/NA: Aggregate Gross Floor Area (sq.ft.)						
Total Number of Racks (#)						
Total Number of Physical Servers by Type (#)						
Mainframes (IBM or compatible)						
Mainframes (Other)						
Windows Servers						
Linux Servers						
UNIX Servers						
Other Servers						
Aggregate Data Center Energy Usage (kWh/year)						
Aggregate Data Center Energy Costs (\$/year)						
Aggregate Data Center Building Operational Cost (\$/year)						
Aggregate FY Construction, Expansion, Consolidation Budget (\$/year)						

## Savings Template- Requested Data:

- Data Center Count Reduction (#):**
  - Tier I-IV Data Centers
  - Server Rooms/Closets
- Rack Count Reduction (#)**
- Server Count Reduction – by Server Type:**
  - Mainframes (IBM or compatible) (#)
  - Mainframes (Other) (#)
  - Windows Servers (#)
  - Linux Servers (#)
  - UNIX Servers (#)
  - Other Servers (#)

# Appendix B: Final Consolidation Plan – Utilization Template

Agency-Wide Utilization Plan						
Department Name	Department ABC					
Agency Name	ABC Agency Name					
	Calculated from Baseline	Target				
	4Q10	4Q11	4Q12	4Q13	4Q14	4Q15
<b>Average Virtualization (%) (Virtual Host Count / Total)</b>						
Mainframes (IBM or compatible)						
Mainframes (Other)						
Windows Servers						
Linux Servers						
UNIX Servers						
Other Servers						
<b>Average Number of VMs per Virtual Host (#)</b>						
Mainframes (IBM or compatible)						
Mainframes (Other)						
Windows Servers						
Linux Servers						
UNIX Servers						
Other Servers						
<b>Average Physical Server Utilization (%)</b>						
Mainframes (IBM or compatible)						
Mainframes (Other)						
Windows Servers						
Linux Servers						
UNIX Servers						
Other Servers						
<b>Average Power Usage Efficiency (PUE)</b>						
Average Rack Space Utilization (%)						
Average Rack Floor Utilization (%)						
Average Power Density Capacity Equivalent (W/sq.ft.)						

## Utilization Template – Requested Data:

1. Average Virtualization – by Server Type (%)
2. Average # of VMs per Host – by Server Type (#)
3. Average Physical Server Utilization – by Server Type (%)
4. Average Rack Space Utilization (%)
5. Average Power Density Usage Equivalent (W/sq.ft.)
6. Average PUE

## **6. Next Steps & Questions**

OMB feedback to Agencies

**OMB & GSA PMO Team**

The screenshot shows a web browser window displaying the FDCCI homepage on CIO.gov. The browser's address bar shows the URL: <http://cio.gov/pages.cfm/page/Federal-Data-Center-Consolidation-Initiative>. The page features a navigation menu with the following items: ABOUT US, CIO COUNCIL, COMMITTEES, VIDEO, EVENTS, and PRIORITIES. Below the navigation menu, there are links for SHARE and SUBSCRIBE. The main content area is titled "Document List - Federal Data Center Consolidation Initiative" and lists several categories of documents:

- FAQs**
  - FDCCI FAQs
- Workshops**
  - Workshop I - June 4, 2010
  - Workshop II - June 11, 2010
  - Workshops DHS DCM Lessons Learned
- Kick-off - February 26, 2010**
  - Federal Data Center Consolidation Initiative
  - Agency Consolidation Plan Template
  - Data Center Consolidation Plan
- Initial Asset Inventory - April 30, 2010**
  - Asset Inventory Initial Data Center Consolidation Initiative Template
- Initial Consolidation Plan - June 30, 2010**
  - Initial Plan Memo
  - Consolidation Plan Initial Consolidation Plan Example
  - Initial Consolidation Template
- Final Asset Inventory Baseline - July 30, 2010**
  - Final Inventory Baseline Guidance
  - Final Inventory Baseline Template
  - Final Inventory Baseline Template in Rows
- Final Consolidation Plan - August 30, 2010**
  - Final Consolidation Template
  - Final Consolidation Plan Guidance

On the right side of the page, there is a search bar labeled "Search CIO.gov" with a "GO" button. Below the search bar are three promotional boxes:

- TECHSTAT**: TechStat helps agency investments bring projects back to performance. [LEARN HOW >](#)
- FedRAMP**: [LEARN MORE >](#)
- IT DASHBOARD**: [LEARN MORE >](#)