

**Integration for Success of Revitalization, Redevelopment, Remedial Activities, and Deactivation and Decommissioning at Oak Ridge National Laboratory– 11212**

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**ABSTRACT**

Oak Ridge National Laboratory (ORNL), managed by UT-Battelle, LLC, is the Department of Energy's (DOE's) largest science and energy laboratory. As a result of aggressive environmental remediation and sustainability efforts, the laboratory's building inventory has been streamlined, resulting in a high demand for redevelopment space on which to build future facilities. The proposed growth space is located on ORNL's central campus, which contains a unique combination of numerous excess buildings, hot cell facilities, waste tanks, and historic landmarks. The American Recovery and Reinvestment Act of 2009 provides a source of funding for beginning deactivation and decommissioning (D&D) and performing any necessary remedial action.

The Environmental Management Program Office (EMPO) was specifically created at ORNL to integrate D&D and remedial action work with ORNL's Facilities Strategic Planning Division (FSPD). The EMPO/FSPD team has implemented an integrated planning and project coordination process that uses a unique network-based toolbox, the ORNL Major Projects Coordination (MPC) site, which streamlines communication among the many independent DOE prime contractors and laboratory personnel. This approach uses a fully integrated project schedule and uses SharePoint to track critical interface points among contractors and ORNL employees and coordinate the necessary meetings among all personnel involved. Several project management tools have been developed to facilitate communication including a dynamic ORNL campus master plan; special SharePoint tools for project coordination, out-year transition plans, and schedules by area; block interface plans; a utility deactivation matrix; and historical documentation.

This paper will discuss the tools that have been developed specifically for ORNL's redevelopment planning with consideration of maximum benefit to ORNL and DOE as well as effective and safe integration of multiple client and client contractor activities.

**INTRODUCTION**

Oak Ridge National Laboratory (ORNL) has undergone a remarkable transformation in recent years. In 2000, the lab developed a 10 year plan [1] to begin modernizing its facilities to meet the scientific challenges of the 21<sup>st</sup> century. Redeveloping the east and west portions of the ORNL campus was an important part of that plan, and much progress has been made thus far. The next 10 year plan will focus on developing ORNL's central campus, which will create a "bridge" between the redeveloped and modernized east and west campus.

ORNL's central campus is home to reactors and laboratories from the 1940s, as well as excess, derelict, and contaminated structures designated for deactivation and decommissioning (D&D); buried waste; underground liquid low-level waste tanks and associated process and transfer pipelines; contaminated surface and subsurface soil, sediment, surface water, and groundwater; and inactive groundwater monitoring wells.

Molding ORNL's central campus into the centerpiece for a revitalized ORNL is a daunting challenge. Meeting this challenge will require new specialized laboratory and office buildings, upgraded cross-campus utilities, and new parking and green space. Performing the necessary D&D with minimal

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interruption to ORNL’s ongoing central core mission operations adds still more complexity to the challenge of redeveloping ORNL’s central campus.

**SITUATIONAL NEED**

ORNL is a huge (approximately 4470 acres) site, part crumbling infrastructure, part state-of-the-art research park, located on a major ridge top between two distinct valleys in East Tennessee. ORNL has 37 miles of paved roads, 180 miles of unpaved roads, and 115 acres of maintained grounds, and is accessible from two state highways, State Routes 95 and 62. ORNL is home to approximately 330 buildings and 75 trailers, owned by three distinct Department of Energy (DOE) offices—the Office of Science; the Office of Nuclear Energy; and the Office of Environmental Management. It is important to note that multiple prime contractors manage multiple components and aspects of this unique, complicated, massive DOE site. Figure 1 provides an overview of the many prime contractors operating on ORNL’s central campus.

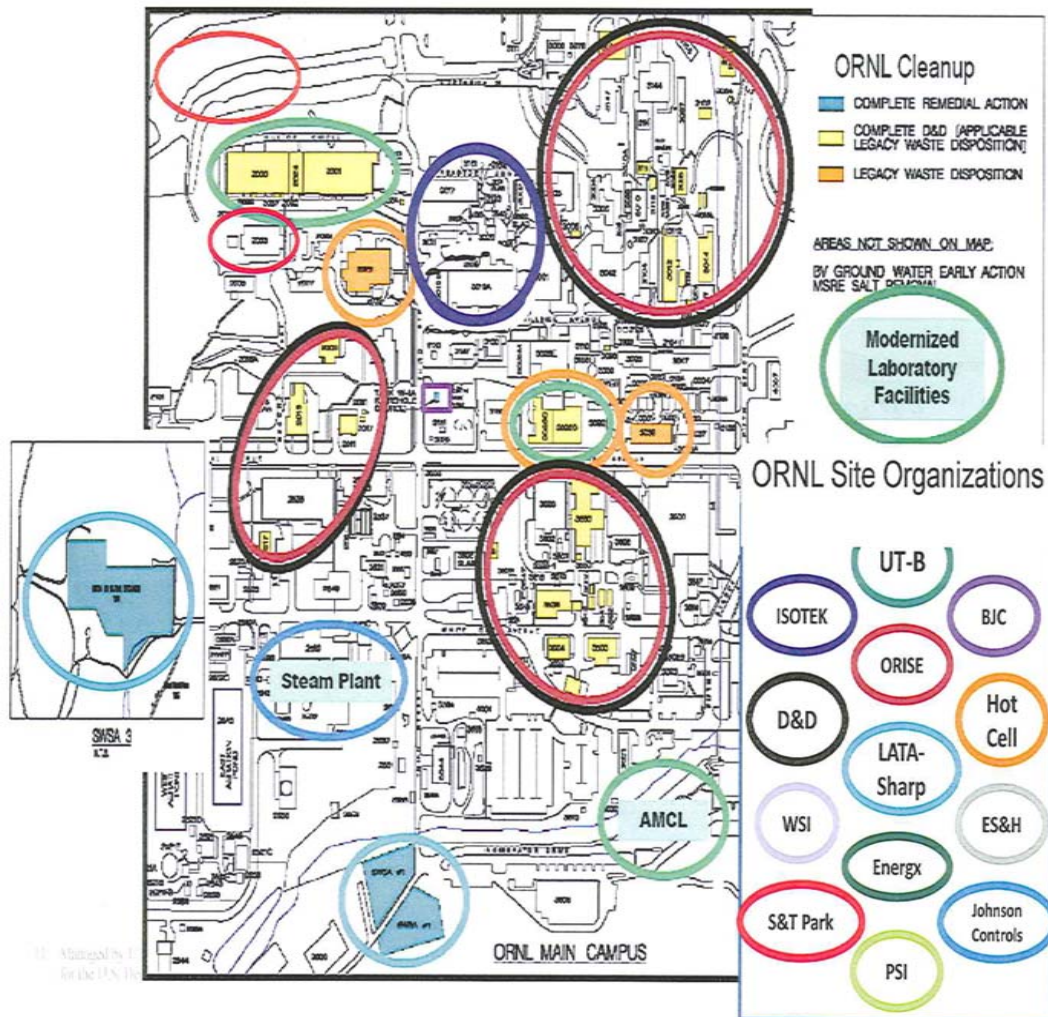


Fig. 1. ORNL central campus prime contractor interfaces.

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Below is a brief synopsis of the various major independent DOE prime contractor activities on ORNL's central campus.

- UT-Battelle: demolition of the 2000 Area Complex, demolition of the Building 3026 Superstructure, construction of the Advanced Materials Characterization Laboratory, area subsurface/surface soil and slab characterization
- Johnson Controls: steam plant modernization and campuswide energy-efficiency facility upgrades
- LATA Sharp – remediation of Solid Waste Storage Areas 1 and 3
- Safety and Ecology Corporation – multiple facility legacy material removal projects coupled with the demolition of 34 distinct facilities and demolition of the Building 3026 Hot Cells
- Isotek: uranium-233 material downblending and disposition at Building 3019
- Bechtel Jacobs Company LLC: remediation of Core Hole 8 Plume, removal of Tank W1A, contaminated groundwater collection system, surveillance and maintenance of laboratory excess buildings for DOE's Office of Environmental Management.

In addition to the DOE prime contractor activities, DOE has leased a 12 acre parcel of land in the northwest corner of the central campus to the Community Reuse Organization of East Tennessee (CROET). CROET has in turn used this parcel to create the Oak Ridge Science and Technology Park, a commercially owned business park dedicated to fostering technology transfer. Recently, the Pro2Serve Corporation constructed a major new facility within the park. DOE also leased Building 2033 to CROET as a private-sector technology-transfer incubator facility.

As described in the above text and as illustrated in Fig. 1, ORNL's central campus includes excess buildings and other facilities designated for D&D as well as areas requiring remedial action before reuse. In addition to D&D and remedial actions, the site is undergoing a significant retooling, rebuilding, and revitalization program that is driving the immediate need for clearing and releasing acreage for redevelopment.

The American Recovery and Reinvestment Act of 2009 (ARRA) provides a very desirable and necessary funding source for meeting the challenges of D&D and remedial action. How can ORNL integrate the strategic vision for central campus redevelopment that creates a bridge between the east and west campuses while demolishing approximately 200 buildings and structures, complete the required remedial actions (per the Bethel Valley Record of Decision [2]), and successfully relocate central campus missions with minimal impact to ORNL's daily operations?

ORNL chartered a team to assess, improve, and implement the processes for managing this challenge and identifying potential risks associated with an injection of such a large pool of funds and construction/D&D work. The focus of this team includes:

- With sudden, but limited, D&D and remedial action funding, identify the tools, methods, and processes that best define the path forward for the site while taking full advantage of the limited funding.
- Identify the best processes and tools for providing integrated project management to multiple clients and their contractors.
- Develop a multiorganizational coordination plan that reduces risks and ensures success in executing core- and ARRA-funded activities concurrently.
- Accomplish ORNL's missions, meeting safety and emergency management goals and maintaining program continuity while providing an effective interface among multiple funding sources and the multiple operating contractors.

If the interface points among the highlighted DOE prime contractors and CROET are not effectively managed, bottlenecks, safety issues, project delays, false stop/starts, etc., could result in severe operational implications for ORNL. This paper describes the processes and tools developed to manage the central campus interfaces that ensure successful ORNL revitalization, redevelopment, and remedial activities.

## PROJECT COORDINATION AND INTEGRATED PLANNING

### Project Coordination

#### *ORNL Major Project Integration Team*

For maximum efficiency of ORNL’s multiple project activities, UT-Battelle provides site project integration, a function crucial to ensuring mission accomplishment, safety, program continuity, and emergency management. This integration function provides an effective interface between the multiple funding sources and the multiple operating contractors. Projects must be carefully coordinated with ongoing mission activities as there are numerous ORNL programs and organizations that could affect or be affected by ARRA-funded project execution. Concurrent projects could possibly compete with each other for limited resources and limited access to infrastructure. ORNL has been coordinating organizational interfaces for multi-funded projects during the past 10 years of facility modernization activities. This coordination includes maintaining an extensive listing of key personnel (Fig. 2) assigned to interface ORNL’s complex activities with ongoing D&D to minimize impacts for all entities.

Major Projects Coordination Team Role	Directorate	Division
Integration Manager	F&O	Facilities Strategic Planning
IFDP Coordination	F&O	Facilities Development
Capital Projects	F&O	Facilities Development
3rd Party Projects	F&O	Facilities Development
Parking & Traffic	F&O	Campus Support & Instrumentation
General ESH&Q Oversight	ESH&Q	
S&H	ESH&Q	Safety Services
Facilities Development	F&O	Facilities Development
Craft Resources	F&O	Campus Support & Instrumentation
Rad Protection & Facility Safety	ESH&Q	Nuclear & Radiological Protection
Environmental	ESH&Q	Environmental Protection & Waste Services
Communications	Communications	Communications
Sustainability	F&O	Facilities Strategic Planning
LSS/Emergency Planning	F&O	Laboratory Protection Division
Logistics	F&O	Logistical Services
Utilities - ESPC	F&O	Utilities
Utilities - Operations	F&O	Utilities
Utilities - Operations	F&O	Utilities
Construction	F&O	Facilities Development
Facilities Management	F&O	Facilities Management
Space Use/Allocation	F&O	Facilities Management
Integrated Operations	F&O	Integrated Operations Support
Fabrication Division	F&O	Fabrication, Hoisting & Rigging
Moves	F&O	Facilities Development
S&T Park	Partnerships	Partnerships
ARRA Project Tracking Coordinator	F&O	Facilities Development
ARRA Program Manager	Business Information Systems	Business Management
DOE Site Office	DOE	DOE
DOE Mission Integration & Projects	DOE	DOE
Network/Telcom Group Leader	Computational Sciences	Information Technology Services
EM Program	NOD	Environmental Mgt. Program Office

Fig. 2. ORNL’s Major Projects Coordination Team.

ORNL’s Major Projects Coordination Team meets monthly to discuss and manage ongoing interfaces with ARRA and major ORNL projects and to strategize a coordination that best supports the laboratory and DOE. This is accomplished by:

- capturing all significant project activities occurring at ORNL during the next 3 years in one integrated plan,

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- reviewing the integrated plan and identifying potential impacts to ORNL operations and other projects, and
- ensuring feedback mechanisms are in place to address multi-party interests in planning and execution of ORNL and environmental management work scope.

### ***Environmental Management Contractor Integration Team***

The Environmental Management Contractor Integration Team consists of key members of the ORNL Major Projects Coordination Team. The contractor integration team meets monthly with representatives from each DOE prime contractor associated with environmental management work to discuss progress on projects and review critical interface points and the integrated schedule. This meeting is hosted by ORNL's Environmental Management Program Office.

### ***ORNL Projects Core Team***

The ORNL Projects Core Team consists of key project managers in the Facilities and Operations Directorate and the Environmental Management Program Office. The core team meets weekly to identify actions/responsibilities related to “hot” issues, update status and identify critical interface points, and report on changes and potential changes to the ORNL “living” master plan.

### ***Project-Specific Interface Teams***

In addition to the monthly Major Project Integration Team and Environmental Management Contractor Integration Team meetings and the weekly ORNL Projects Core Team meetings, there are also project-specific team meetings held on various schedules. For example, for the IDIQ 34 Building Facility Deactivation, Demolition, and Removal Contract, a weekly project meeting is held. Representatives of DOE and four independent companies gather to discuss in detail utility isolations, characterization results and progress, waste profile approval schedules, and real-time field demolition and remediation activities.

### ***Daily Plan-of-the-Day Meetings***

Each major entity holds plan-of-the-day meetings or “PODs” attended by field personnel and project-related support personnel from independent companies. These PODs ensure clear day-to-day communication related to critical interface points, schedule milestones, and support requirements.

## **Communication Tools**

### ***ORNL Today***

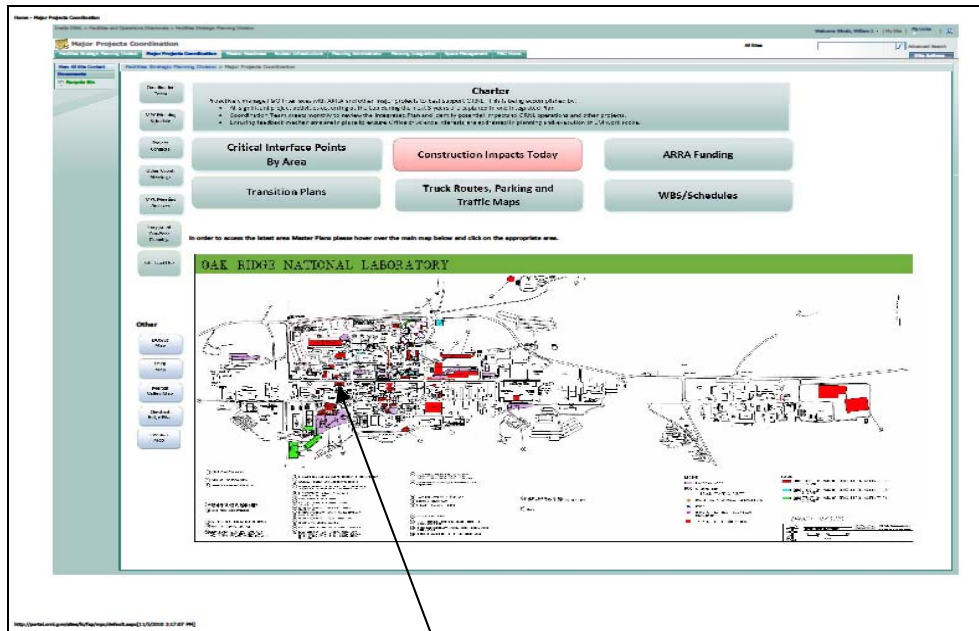
The team has at its disposal for “instant messaging” to all campus personnel the *ORNL Today* website (Fig. 3). *ORNL Today* is used for posting road closures, pedestrian walkway closures, utility outages, completed building demolition, and project success stories and is invaluable for up-to-date communication available to all campus employees.



Fig. 3. *ORNL Today* home page.

### ***Interactive Web-Based Toolbox: Major Projects Coordination Site***

The ORNL Project Team uses an interactive web-based toolbox (via SharePoint) to capture, document, and have instantly available real-time information across the laboratory. This interactive toolbox, referred to as the Major Projects Coordination (MPC) site, includes on its home page a map of the entire ORNL campus (Fig. 4 shows the MPC site home page). The campus map is broken down into manageable quads. By clicking on the desired quad, the user can highlight that area of the campus. Figure 5 shows the central campus 2000 quad area detail plan, which can be obtained by clicking on the area shown on the main campus map. This detailed map delineates all near-term project activities within the quad.



Clicking on this section of the main page leads to the sub-quadrant layout shown below in Fig. 5.

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Fig. 4. ORNL MPC site’s main page.

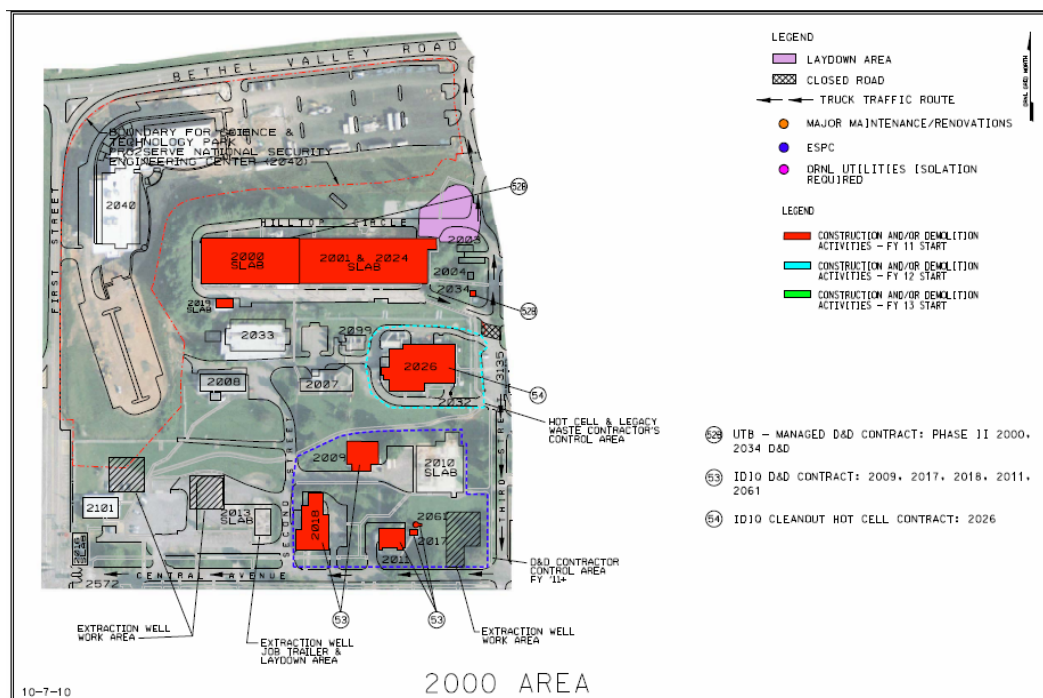


Fig. 5. Central campus 2000 quad area detail plan.

**Critical Interface Points**

Critical interface points may be referenced via the MPC site home page under the tab “Critical Interface Point.” Any project work activity that can affect ORNL operations or other projects is considered a critical interface point; these can include:

- Road closures
- Pedestrian re-routes
- Lay down areas
- Heavy equipment deliveries
- Ties to other projects
- Outages or other impacts to research operations
- Assembly points and other safety-related impacts

Figure 6 shows an example of the tabular reference obtained when the “Critical Interface Point” tab is accessed. This tabular responsibility chart (a simple Excel table) is updated in real time using a checkout feature in SharePoint and allows for specific project management responsibility to be assigned for actions.

F&O Major Projects Coordination					
Critical Interface Points - 2000/3000 Area Buildings					
Updated 10/28/2010					
Item	Impact Date	Project	Description	Responsible	Status
<b>CC Northwest Quadrant (2000 Area)</b>					
1	Through Dec'10	2000 Complex D&D	Second Street traffic disruptions (impacts 2007, 2008, 2033 Ops). Maintain traffic flow during demolition.	Mike Harper/SEC	Active
2	Through Dec'10	2000 Complex D&D	2000 Complex D&D: Hilltop Circle Access Limitations.	Mike Harper	Active
3	Through Dec'10	2000 Complex D&D	2000 Complex D&D: Third Street Road Closure	Mike Harper	Active

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Fig. 6. MPC site: “Critical Interface Points.”

### Construction Impacts Today

With such a massive amount of work being completed by so many different and unrelated entities in a very small area with ongoing critical laboratory operations, real-time daily updates are crucial. Therefore, “Construction Impacts Today” is included as a tab on the MPC site that allows users access to real-time information about project impacts at ORNL (see Fig. 7).

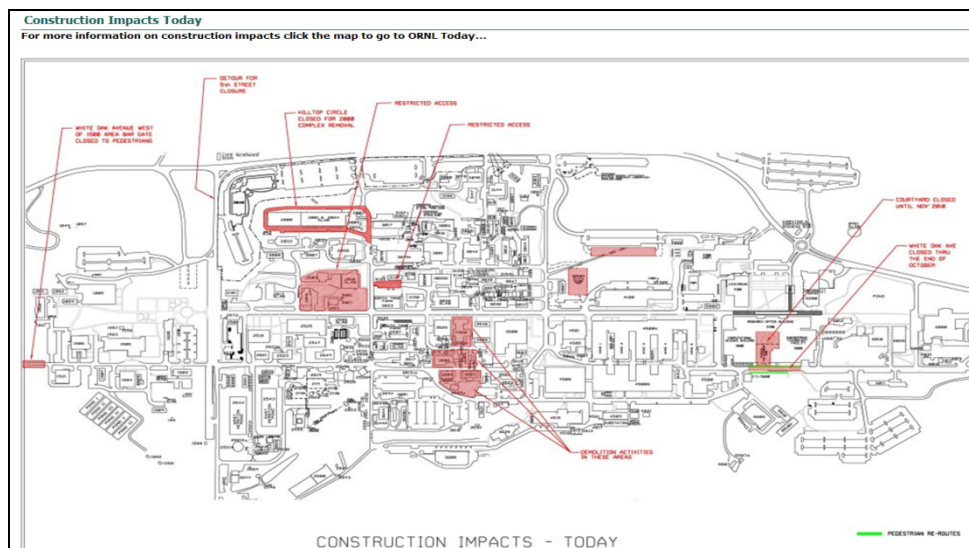
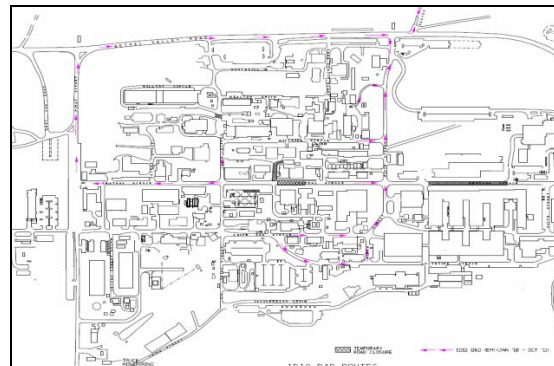
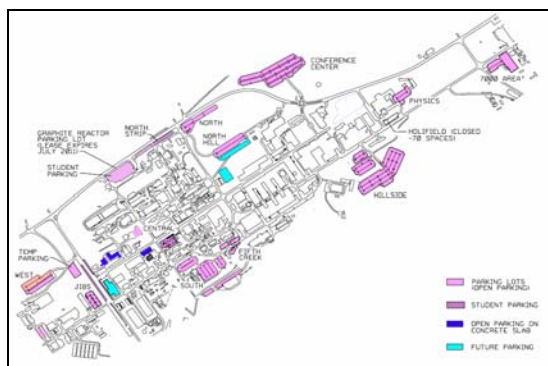


Fig. 7. MPC site: “Construction Impacts Today.”

By clicking on one of the highlighted areas on this page, the user is automatically routed to the specific article associated with the area of interest on the *ORNL Today* site. These articles provide details on timing, detours, contact points for more information, etc.

### Truck Routes, Parking and Traffic Maps

With perhaps four major D&D contractors and two major construction project contractors defining the truck routes for each contractor, identifying road closures and defining available parking areas for more than 5000 employees is critical to ensuring safety and smooth work flow at ORNL. The tab “Truck Routes, Parking and Traffic Maps” provides this information. Two of these informational maps are shown below. Figure 8 delineates available parking and Figure 9 delineates the waste hauling truck routes for a series of building D&D projects.



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Fig. 8. MPC site: ORNL available parking areas.

Fig. 9. MPC site: IDIQ Building D&D waste truck routes.

**Project Schedules**

The work breakdown structure (WBS)/Schedules tab accesses detailed schedules by area, quad, and major project. Figure 10 displays the subcategories of available schedules, and Fig. 11 delineates a portion of the central campus projects schedule.

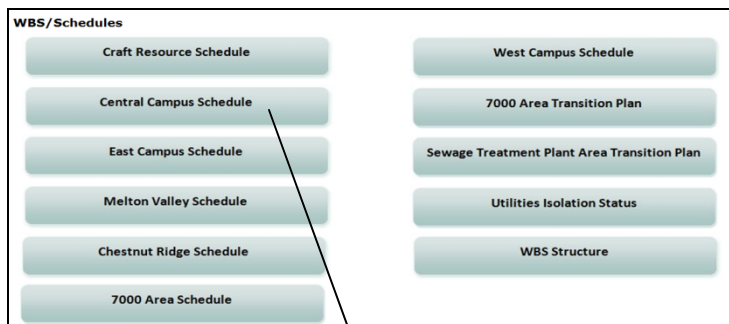


Fig. 10. MPC site: WBS/schedule.

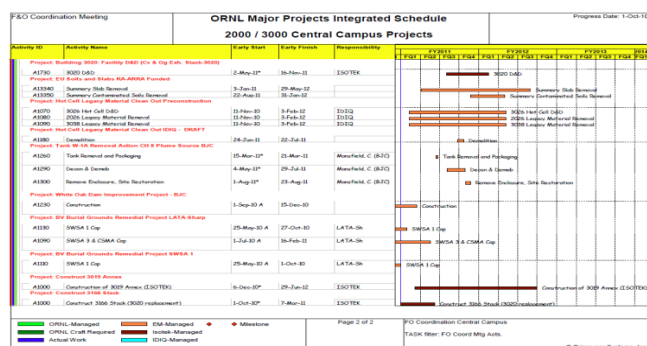


Fig. 11. MPC site: central campus projects schedule.

**What's Next at ORNL—Transition Planning**

The MPC site sections discussed thus far are concerned with ongoing projects. Real-time information and detailed coordination are required for the safe and successful execution of these projects. When areas have been cleared of excess and hazardous facilities and have been remediated, it will be important for ORNL to answer several questions.

- When will areas be ready for redevelopment?
- What does redevelopment entail?
- How do we plan for the future laboratory facilities?

**Transition Plans**

Using detailed multiyear project schedules, the ORNL Projects Core Team, has developed 5, 10, and 15 year transition plans for the central campus area. Motivation for continuing and completing D&D and future direction is gained by having a solid view toward redevelopment at the lab on the same web link as

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the current project work. The user can access planning information by clicking the “Transition Plans” button on the MPC site home page, which leads to a campus map and one of two options. Option 1 allows the user to click on the desired quad and option 2 provides a composite view of the entire central campus. Figure 12 shows the composite 2015 transition plan. This plan details the buildings that will undergo D&D by 2015, the resultant available building sites, future roadways and parking, and future utility corridors.

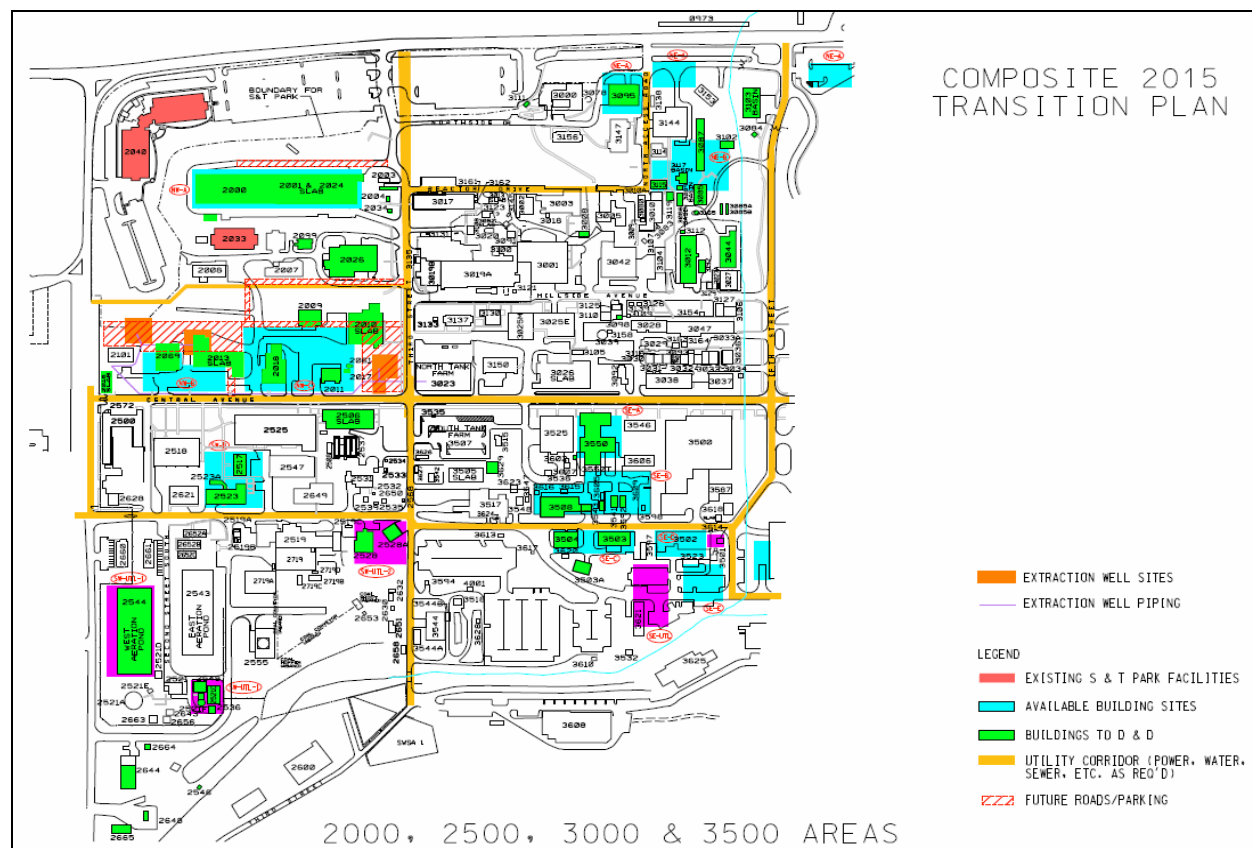


Fig. 12. MPC site: Composite 2015 transition plan.

As with the “Current Project” section of the web link, upon accessing each individual quad, the user can review and use for planning the 2015, 2020, and 2025 redevelopment plans along with a transition plan schedule for that quad and a listing of specific action items.

### **Functional Zoning Diagram**

The MPC site’s “Functional Zoning Diagram” (Fig. 13) is a key redevelopment tool accessible from the “Transition Plans” tab. This diagram is available to assist ORNL administration, directorate leaders, and facility planning staff in decision-making relative to building siting or other campus development issues. The diagram identifies major development zones and indicates appropriate uses for each zone and for major development sites.

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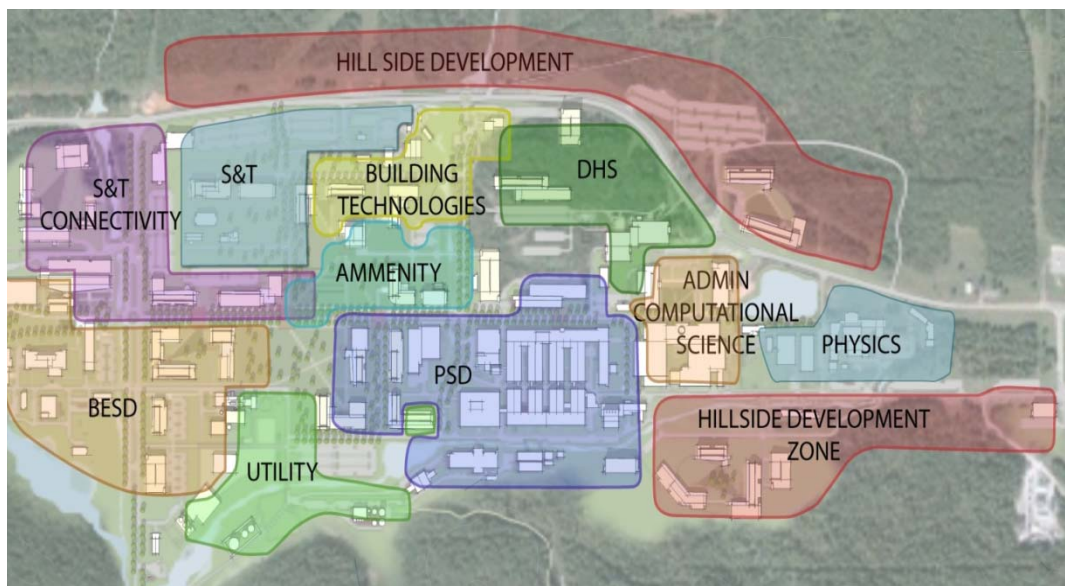


Fig. 13. MPC site: “Functional Zoning Diagram.”

### **CENTRAL CAMPUS REVITALIZATION AND REDEVELOPMENT—THE MASTER PLAN**

With the east and west campus modernization well underway and the 10 year plan for the year 2000 rapidly drawing to a successful close, it is necessary to look to the future, reassess the vision for the central campus, and create a new roadmap for its transformation to meet the scientific challenges of the 21<sup>st</sup> century and beyond.

UT-Battelle, LLC, contracted Flad Architects and Barge Waggoner Sumner and Cannon, Inc., to capture the vision of a revitalized and redeveloped ORNL central campus via the development of a long-range master plan. The purpose of the master plan is to guide the central campus redevelopment and expansion. As obsolete and abandoned facilities in the central campus area are removed and legacy environmental issues are resolved, there is a great opportunity for ORNL to redefine itself as a true research community in the way that future development occurs. Creating modern research and office facilities within functional usage zones, with strong linkages and amenity/support zones connecting them within a well-defined and efficient organizational structure attracts new funded research, recruits exceptional talent, and establishes a truly interactive research environment. The master plan not only establishes the vision and accompanying framework necessary to reach that future but also helps to define the prioritization of the environmental management cleanup activities and other enabling projects in primary development zones and highlights land availability need from a program foundation.

The master plan provides a “crystal ball” perspective for when specific development areas can be redeveloped. This view is based mainly on the currently proposed schedule for Environmental Management release of sites within the central campus area. The master plan can further guide the prioritization of site cleanup depending on ORNL’s specific development needs. Such prioritization will be necessary to allow the timely development of an integrated research community within the central campus as opposed to isolated developments at the perimeter.

Using the master plan as a visionary tool for redevelopment planning along with specific project management tools will allow efficient integration and effective coordination among ORNL’s many distinct, yet connected, projects.

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1. *Oak Ridge National Laboratory Strategic Facilities Plan for Making ORNL a 21<sup>st</sup> Century Laboratory*. Oak Ridge National Laboratory. ORNL/TM-2000/238. (October 2000).
2. *Record of Decision for Interim Actions in Bethel Valley, Oak Ridge, Tennessee*. U.S. Department of Energy. DOE/OR/01-1862&D4. (May 2002).