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Federal Campus Planning: The Value of Planning for Executable Design

Malak Hakim, AICP |4854 Strategic Planner/Project Development

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Sandia National Laboratories is a multimission laboratory managed and operated by National Technology & Engineering Solutions of Sandia, LLC, a wholly owned subsidiary of Honeywell International Inc., for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-NA0003525.

Objective

Explore the value planning for executing facility and infrastructure projects.

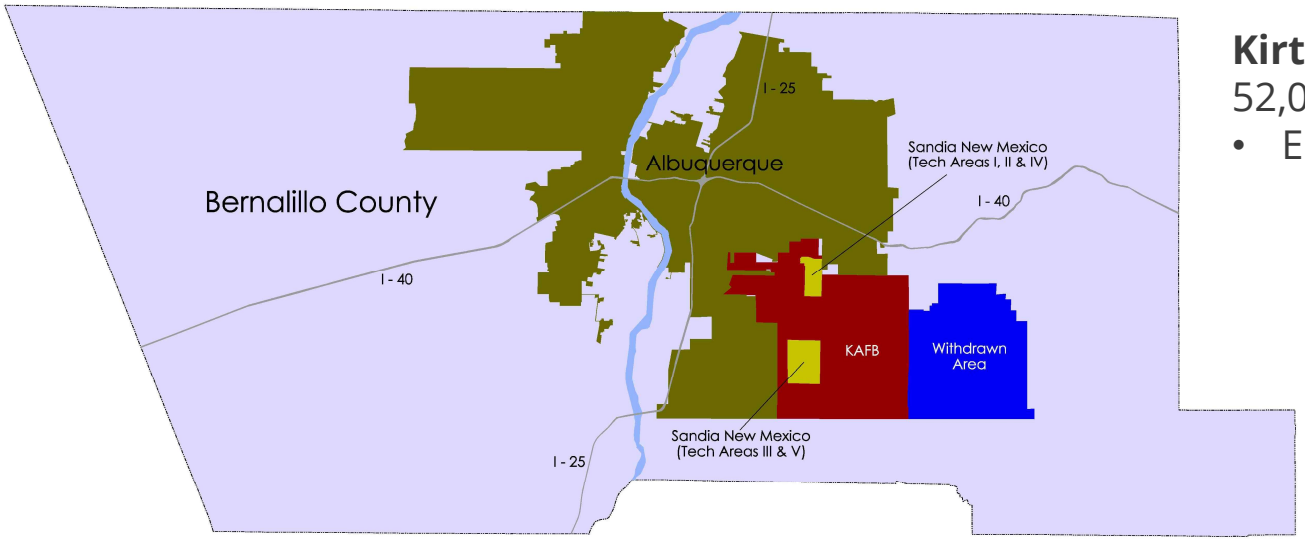
What is Project Development at SNL and why do we do it?

1. But first, **let's orient ourselves with "The Base"** – Sandia National Laboratories (SNL) and Kirtland Air Force Base, the only National Nuclear Security Administration lab situated on an active Air Force Base.

2. Then, let's touch on some recent and ongoing **long-range planning** efforts at SNL, discuss Strategic Planning at the Labs, and see where Project Development fits into the grand scheme of things.

3. Finally, let's get to the meat and potatoes of this presentation and explore how **Project development** address American Planning Association Core Competency 7 – "Management", by touching on sub-categories of decision-making, project management, intergroup and stakeholder relationships, budgeting and financing, and strategic planning. "Management" will be explored through the lens of Project Development (pre-design and programming through schematic design) at SNL and **the value of this planning-level work for Final Design and Execution**.

"The Base"



Kirtland Air Force Base (KAFB) covers 52,000 acres

- Employs over 23,00 people
  - 3,000 active duty
  - 1,100 Guard & Reserve
  - 3,400 Civil Service
  - 12,500 contractors

Sandia National Laboratories (SNL) covers 13,740 acres

- 696 Buildings and Trailers
- 81 other structures and facilities
- Gross SF of 6,184,172
- 101 Permitted buildings
  - 233,834 gross SF of permitted AF land
- Employs 12,300 people

Sandia National Labs (SNL)

Sandia National Laboratories (SNL) is operated and managed by National Technology and Engineering Solutions of Sandia, LLC. (NTESS), a wholly owned subsidiary of Honeywell International, Inc. NTESS operates Sandia National Laboratories as a contractor for the U.S. Department of Energy's (DOE) National Nuclear Security Administration (NNSA) and supports numerous federal, state, and local government agencies, companies, and organizations.

As a Federally Funded Research and Development Center (FFRDC), Sandia may perform work for industries responding to certain types of federal government solicitations. The solicitation must allow FFRDC participation and meet the requirements of Sandia's management and operating contract with the Department of Energy/National Nuclear Security Administration (DOE/NNSA).

SNL History

Sandia's history reflects the changing national security needs of postwar America. Although Sandia originated as a single-mission engineering organization for non-nuclear components of nuclear weapons, today, it is a multiprogram laboratory engaging in research supporting a broad spectrum of national security issues.

Sandia began in **1945** as Z Division, the ordnance design, testing, and assembly arm of Los Alamos National Laboratory. It became Sandia Laboratory in **1948**, and, in 1949, Sandia Corporation was established as a Western Electric company to manage the laboratory. A second site was opened in California's Livermore Valley in 1956. More than two decades later, in **1979**, Congress made Sandia a Department of Energy national laboratory.

Figure 1A: Sandia Aerial View in 1945.

Figure 1B: Opening Day at the 1959 Fair.

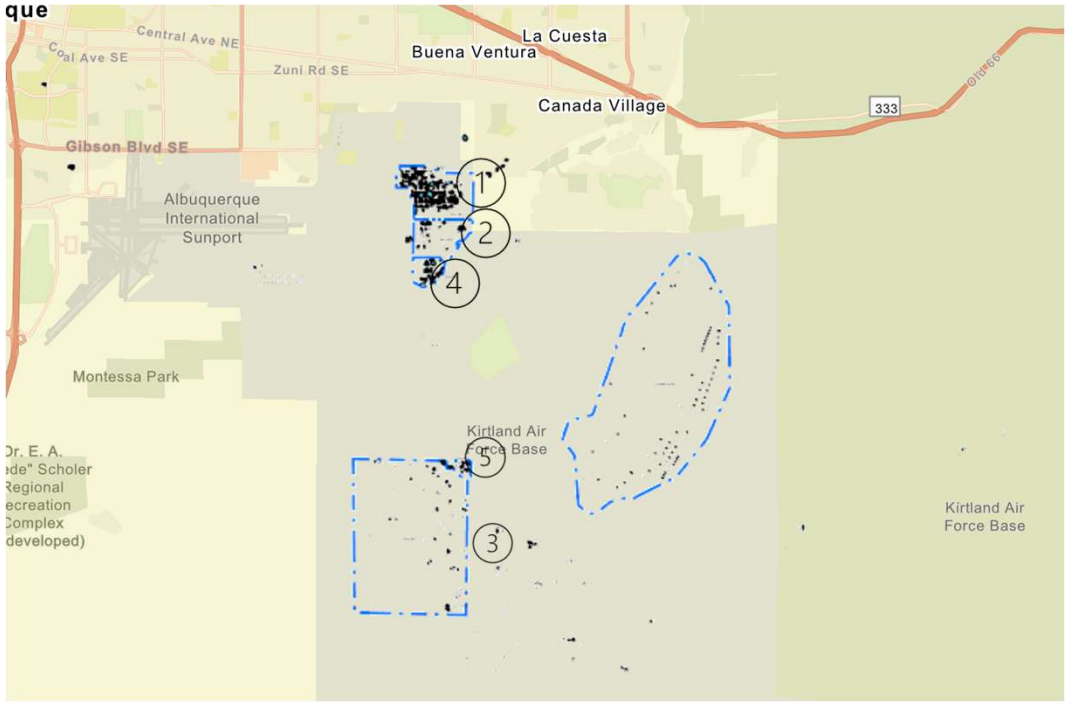
SNL Existing Capabilities

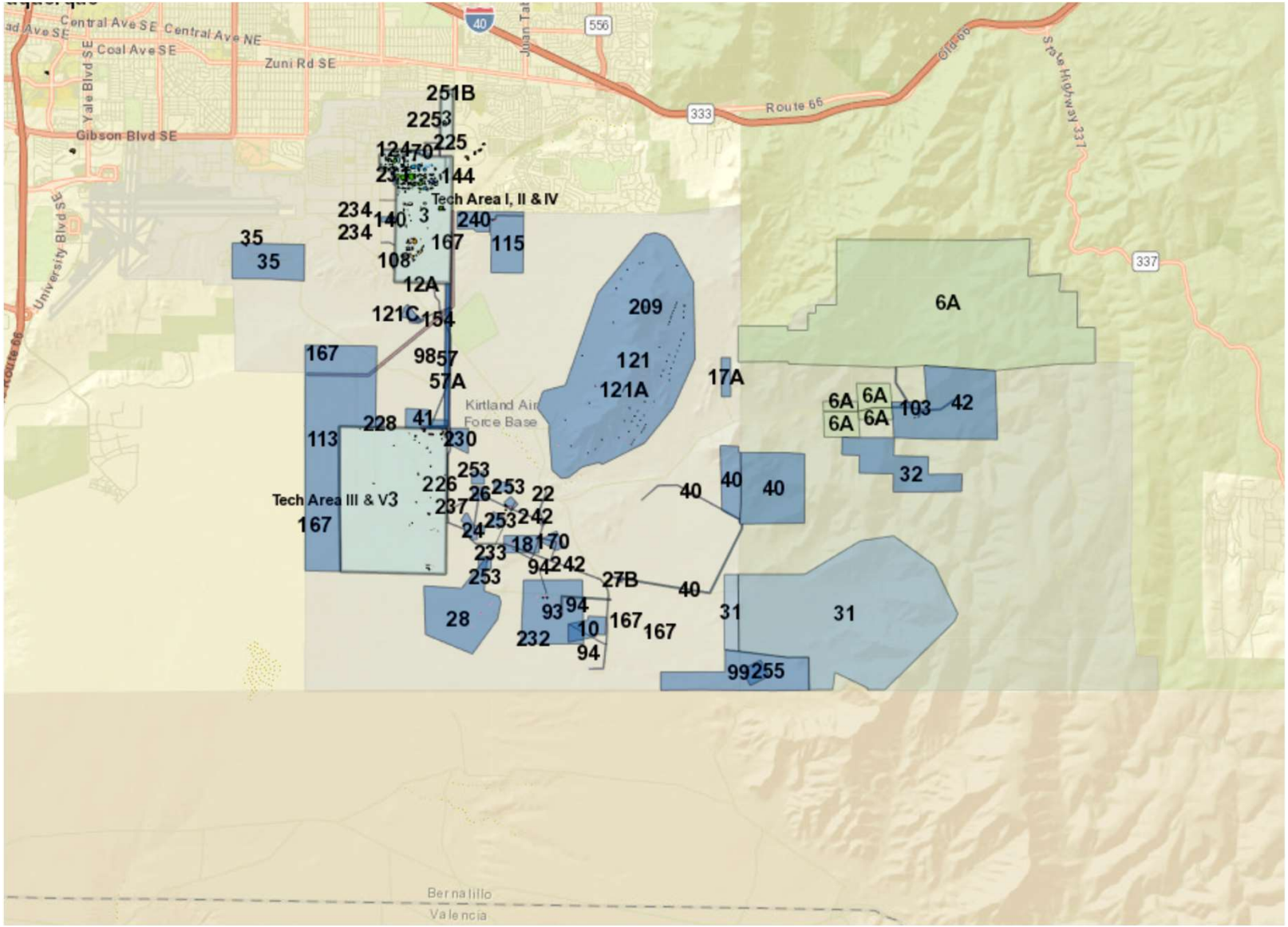
The list below contains the existing capabilities at Sandia. The effort required to provide these capabilities **necessitate investment in facilities and infrastructure to house and support the people and programs delivering these capabilities**:

- Advanced Experimental Diagnostics & Sensors
- Agile Component & Systems Design, Engineering, and Integration
- Cyber & Intelligence Science
- Enabling Operations
- Energetic Materials & Components Science & Engineering
- Engineering Science & Testing
- High-Performance Computing (Computing, Information, and Mathematical Sciences)
- Materials Science & Engineering, & Advanced Manufacturing
- Physical and Biological Sciences and Engineering
- Radiation Effects & High Energy Density Physics
- Rad-Hard Microsystems R&D & Manufacturing
- Simulation Codes, Models, & Data Analytics
- Synergistic Global Security Engineering
- Weapons Component & System Surveillance and Assessment

SNL New Mexico Campus

The SNL/New Mexico Campus, considered SNL's headquarters, is located in Albuquerque, New Mexico, directly south of Gibson Boulevard, between Wyoming and Eubank Boulevards. The **13,740-acre** campus is situated within the Kirtland Air Force Base (KAFB) boundary, which presents unique challenges to site access, physical security, and working relationships with external entities. It comprises **five Tech Areas** that accommodate a mixture of engineering, research and development, manufacturing, and testing activities.




Central Ave SE
Central Ave NE
Coal Ave SE
Zuni Rd SE
Yale Blvd SE
Gibson Blvd SE
University Blvd SE
Route 66
40
556
333
Route 66
State Highway 337
337
Tech Area I, II & IV
Tech Area III & V3
Kirtland Air Force Base
Bernalillo
Valencia
251B
2253
225
144
234
140
3
240
234
167
115
35
35
108
12A
121C
154
209
6A
167
9857
121
17A
57A
121A
6A
6A
6A
6A
103
42
228
41
113
230
32
253
226
253
22
40
40
40
237
253
242
Tech Area III & V3
167
24
18
170
233
94
242
27B
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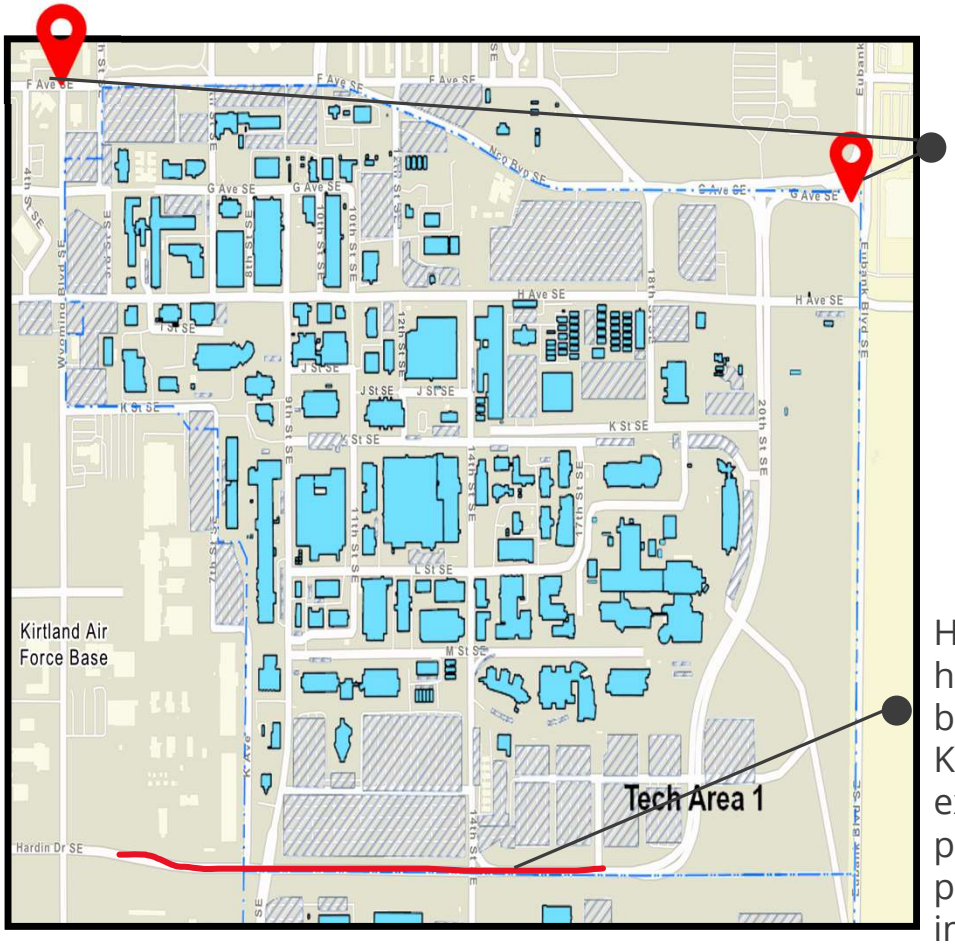
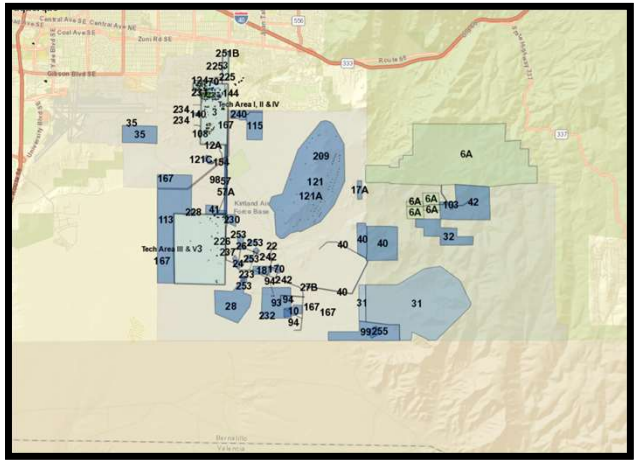
SNL & KAFB Collaboration Opportunities



SNL employees primarily enter the Base at Wyoming & Eubank



KAFB/SNL land use permit consolidation would benefit both SNL & KAFB – opportunities for land transfer?

Hardin Blvd. is heavily used by both SNL & KAFB- it has excess ROW for potential ped/bike improvements

Pennsylvania has frequent use by both SNL & KAFB. SNL uses Pennsylvania to access TA-III, TA-V, and the KAFB permitted areas

SNL Long-Range Planning: 2022 Site-Wide Master Plan

Sandia's Infrastructure Operations ultimate goal is to provide exceptional facilities and infrastructure that support our diverse missions, inspire our workforce, and demonstrate our dedication to national services and world-class engineering and science. The 2022 Site-Wide Master Plan (SWMP) outlines a long-term strategy for development. It guides SNL to make informed decisions about **how best to utilize land, facilities, and infrastructure required to sustain and enhance mission work**. The SWMP was developed with the following considerations:

SWMP – Planning Context

- The SWMP is a Level A Plan and is among several other plans developed under Sandia National Laboratories' Strategic Plan.
- Partnership between organizations is critical to ensuring the various plans all support Sandia's mission needs and provide a comprehensive, cohesive vision.

The SWMP is a long-range plan that outlines a plan for site development for 5-1O+ years.

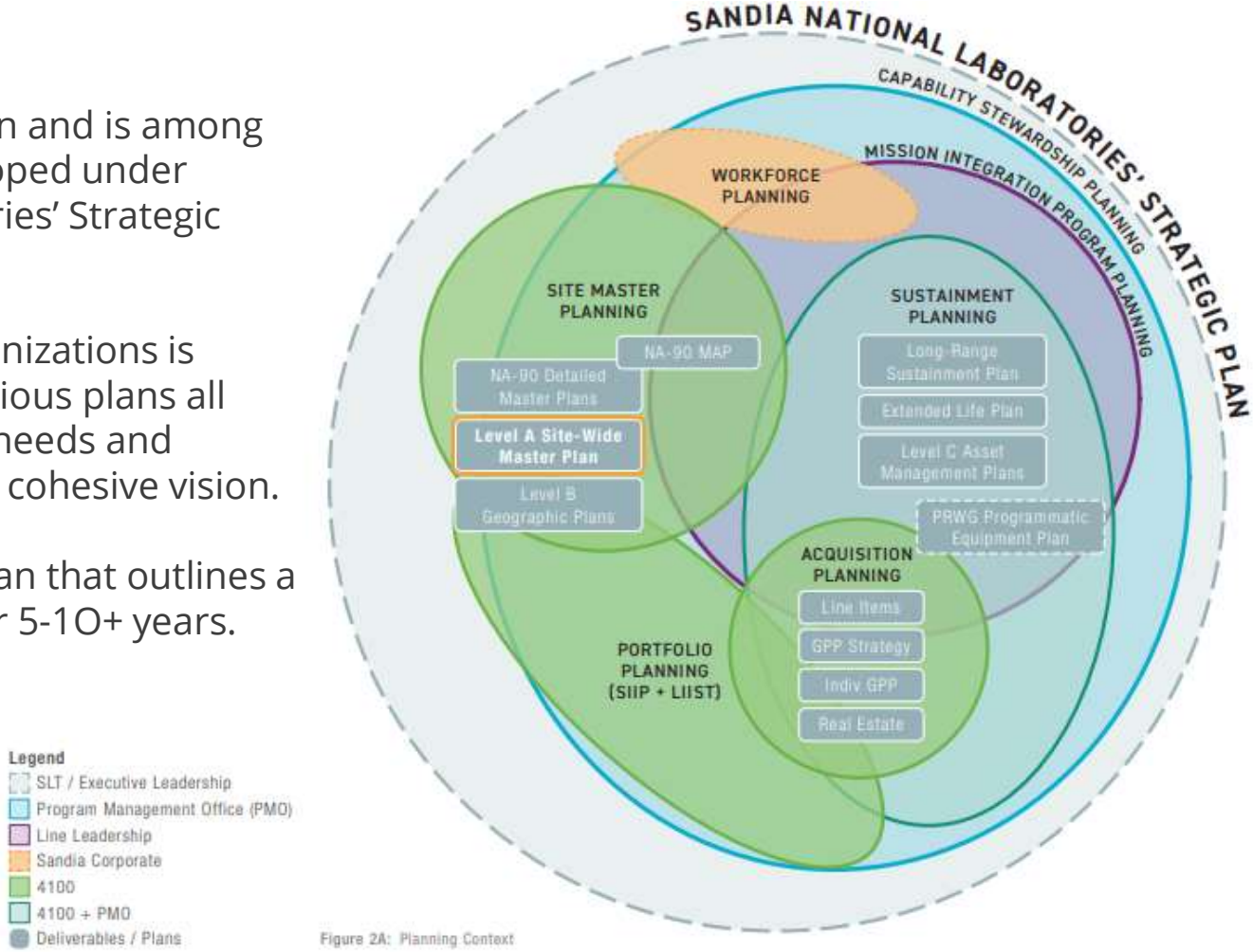


Figure 2A: Planning Context

SWMP – Vision

Guide the physical development of facilities and infrastructure and tie development activities to mission work:

• **Support Mission Work** – Coordinate with Laboratory/Program Leadership to ensure that facilities and infrastructure meet mission needs.

• **Agility** – Provide facilities and infrastructure that can respond to changing missions and environments.

• **Security** – Provide physical spaces and infrastructure that support multiple levels of security requirements.

• **Tech Transfer** – Foster the transfer of technology between SNL and government institutions, universities, and the broader community by creating a balance of high and low-security areas and providing physical spaces for external collaboration.

• **Recruitment and Retention** – Provide physical spaces, facilities, and infrastructure that support mission work and create a healthy and pleasant environment.

• **Internal Collaboration** – Provide physical spaces and flexible facilities that provide on-site locations for internal collaboration.

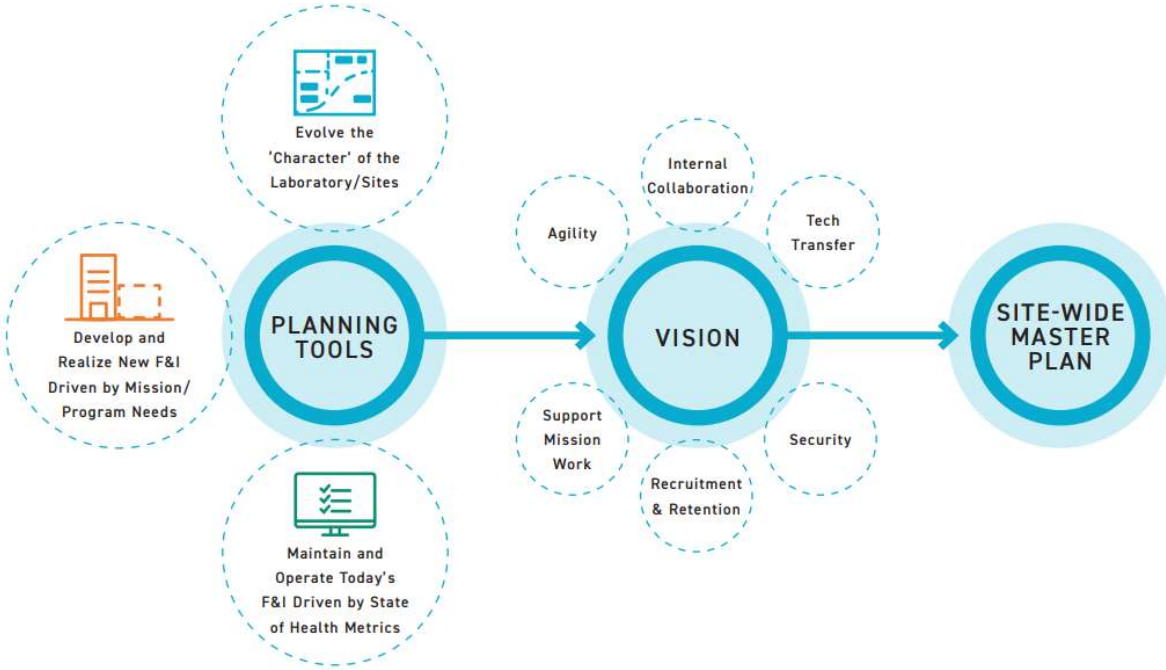
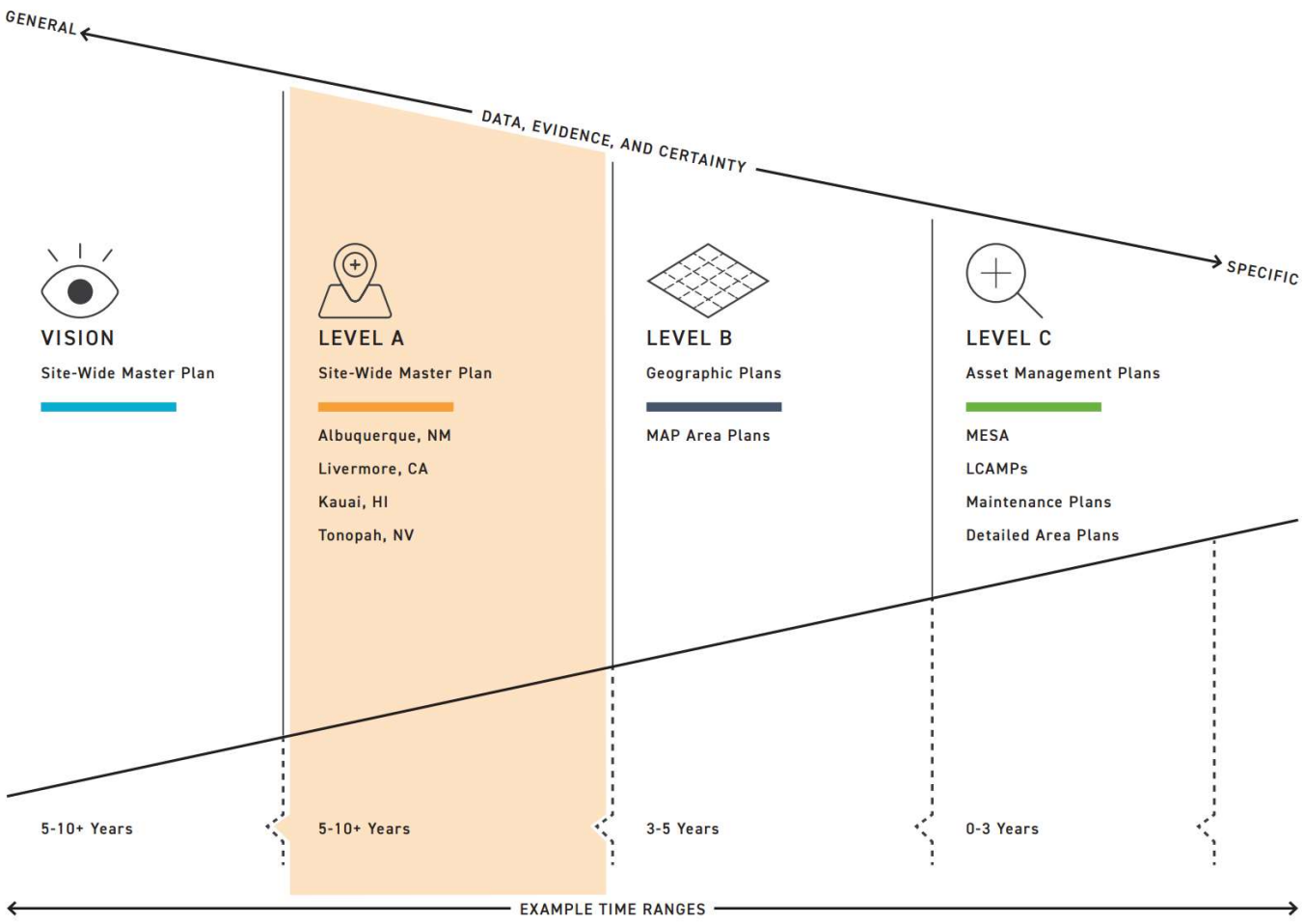


Figure 2B: SWMP Vision, Principles, and Goals

The SWMP Vision guides how we prioritize, plan, and deliver on Facilities and Infrastructure needs for the SNL Campus.

Guiding Plans for Facilities and Infrastructure (F&I)



Planning into Motion

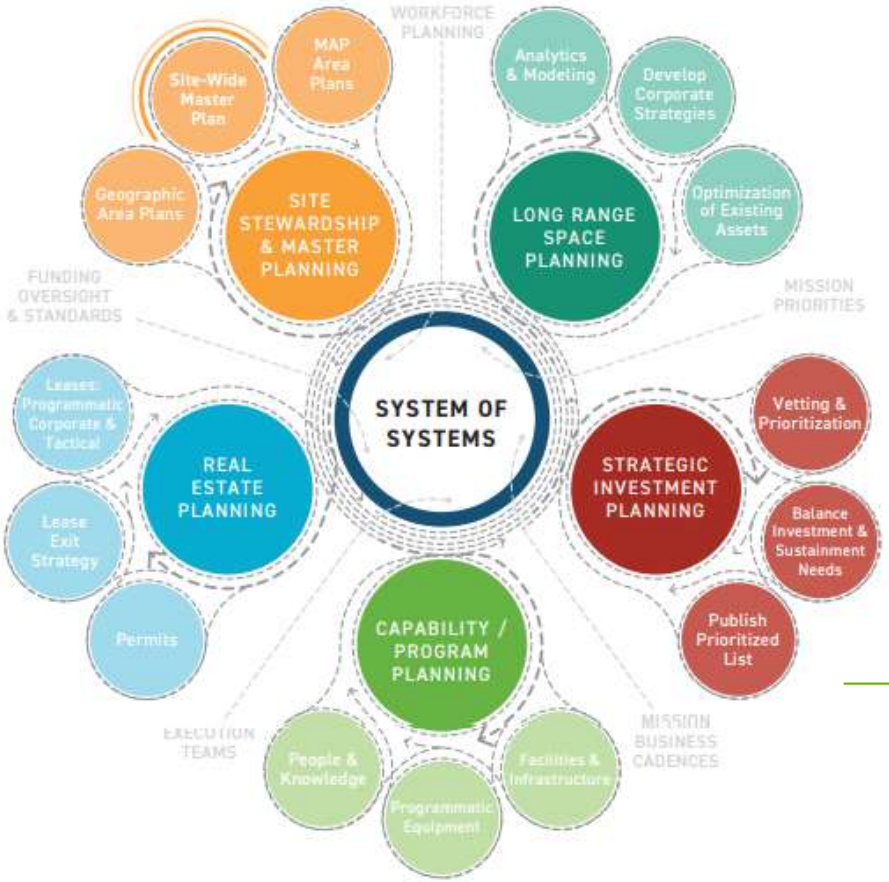
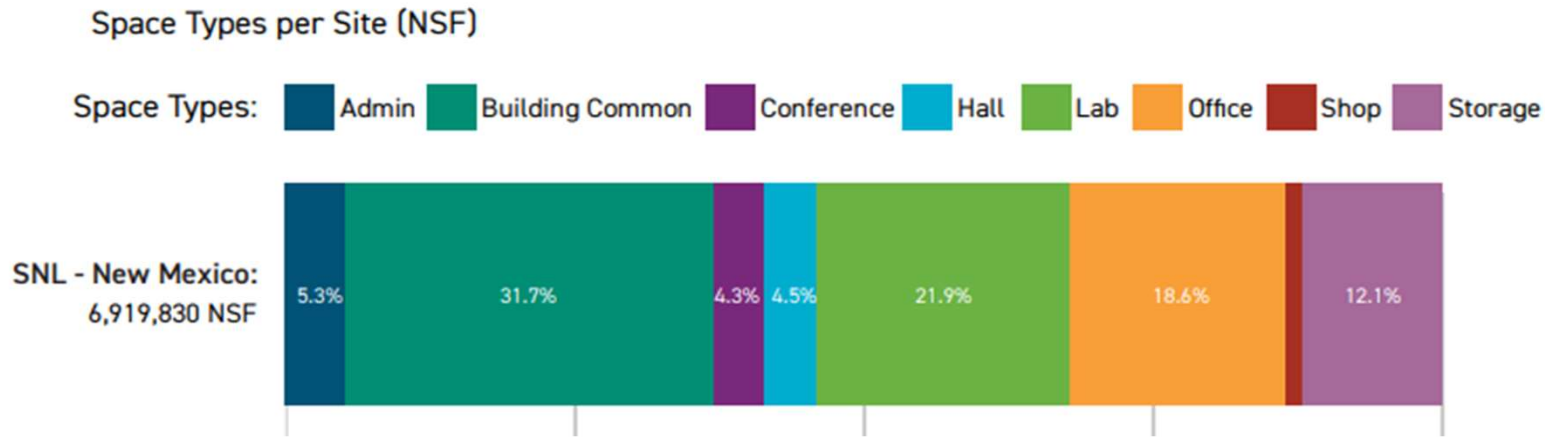


Figure 2J: System of Systems

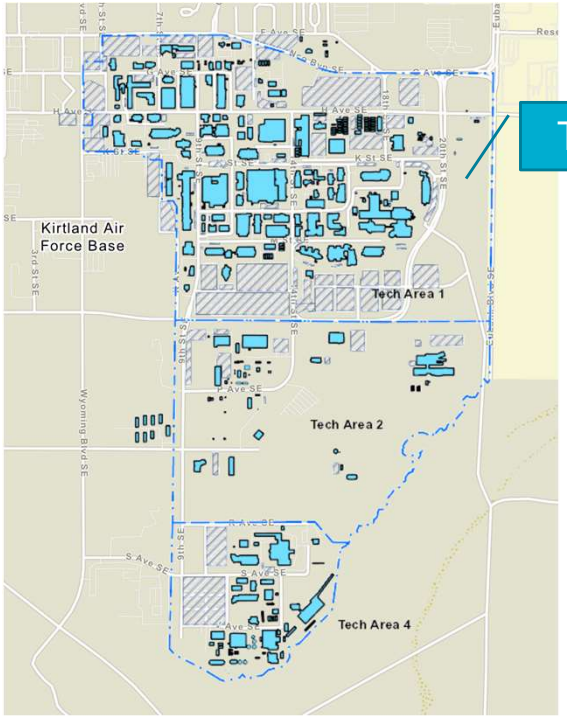
→ **Project Development**

SNL Space Types

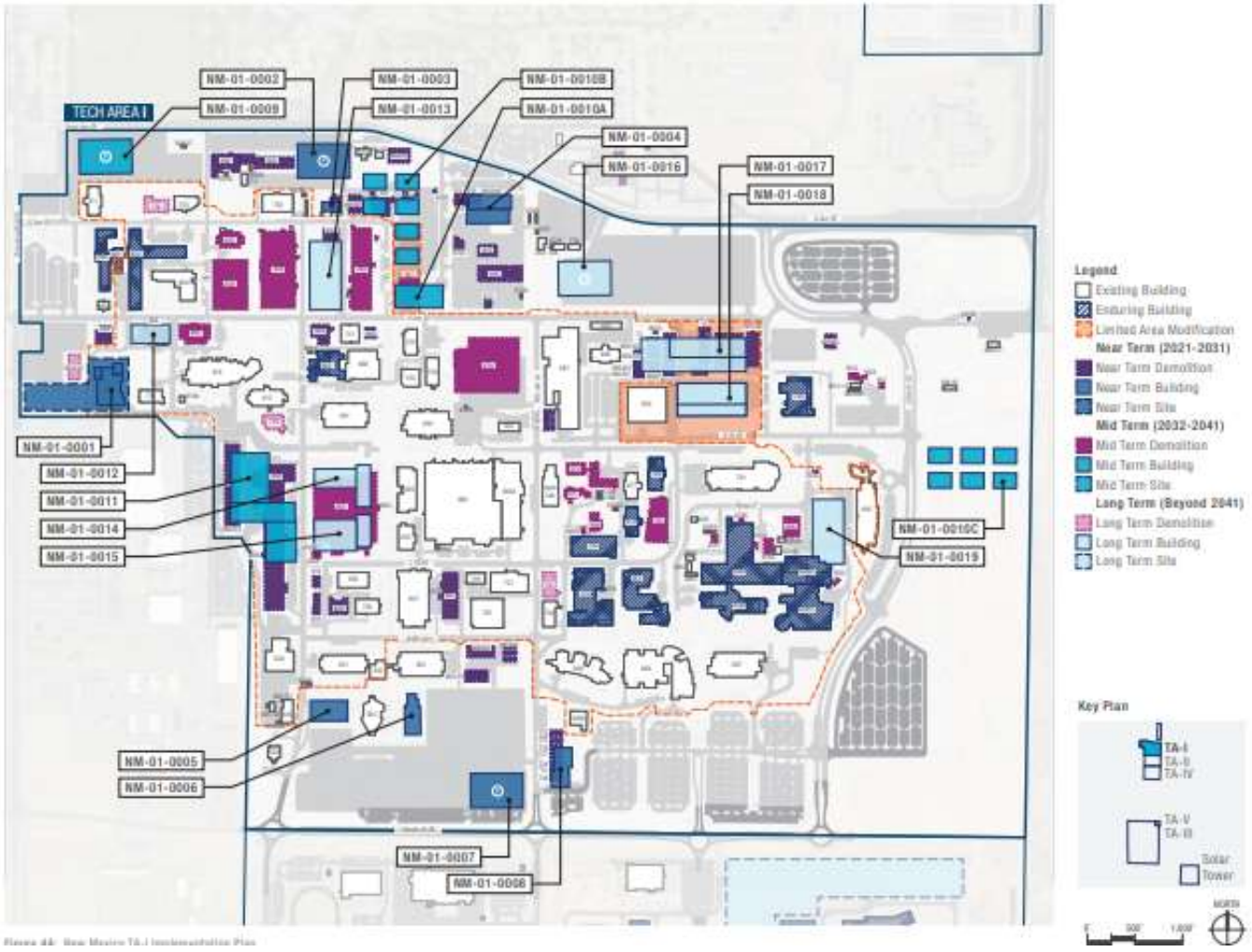


TA-I

TA-I is located along the northern boundary of the SNL/New Mexico campus and serves as the campus ‘front door’. The Eubank Gate is considered the main access area and the primary entry point. TA-I accounts for over 80% of total SNL personnel and 70% of total building square footage, housing primarily Research and Development, Manufacturing, and Administrative Support Services. Most of TA-I’s land has been developed and constitutes the most urban Tech Area environment.

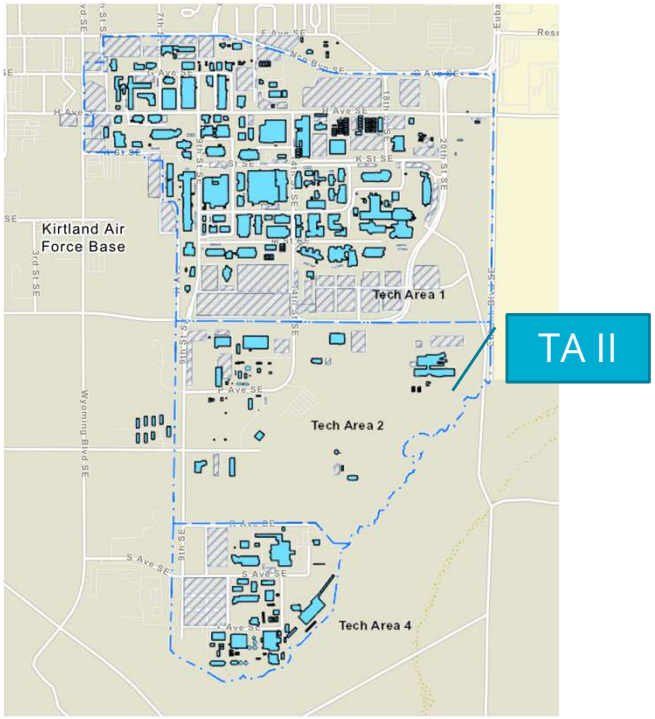


Site-Wide Master Plan – TA-I Implementation Plan



TA-II

TA-II, located between TA-I and TA-IV, hosts a range of activities; the area includes a mixture of Site Support and Operations, Energetics Complex, Engineering, Research and Development, and Testing land uses. Current development in TA-II is concentrated in the north and southwest portion of the area, with some outlier development south of Hardin Boulevard.



Site-Wide Master Plan – TA-II Implementation Plan

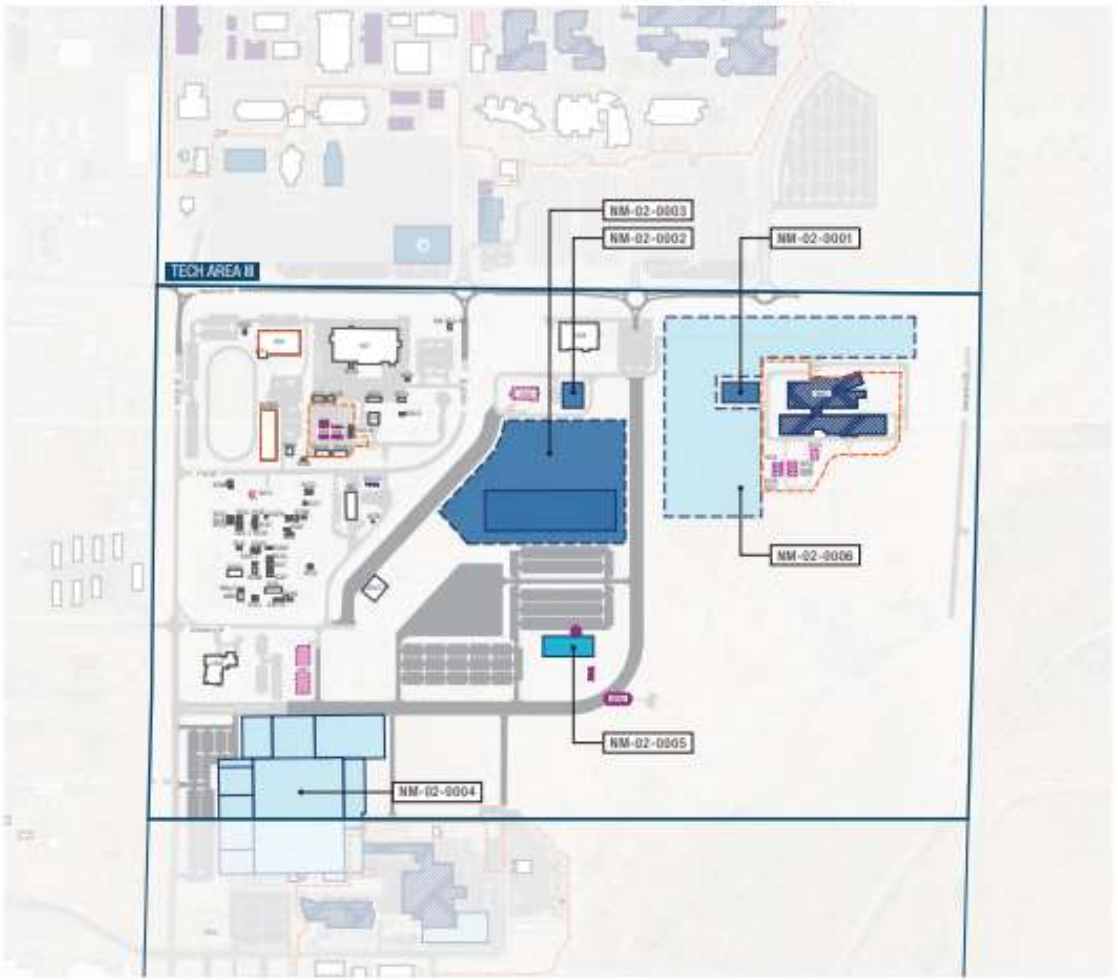


Figure 4C: New Mexico TA-II Implementation Plan

Figure 4B: Power Sources – Alternate SPP Strategy Layout

Legend

- Existing Building
- Enduring Building
- Limited Area Modification

Near Term (2021-2031)

- Near Term Demolition
- Near Term Building
- Near Term Site

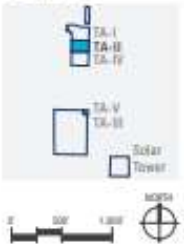
Mid Term (2032-2041)

- Mid Term Demolition
- Mid Term Building
- Mid Term Site

Long Term (Beyond 2041)

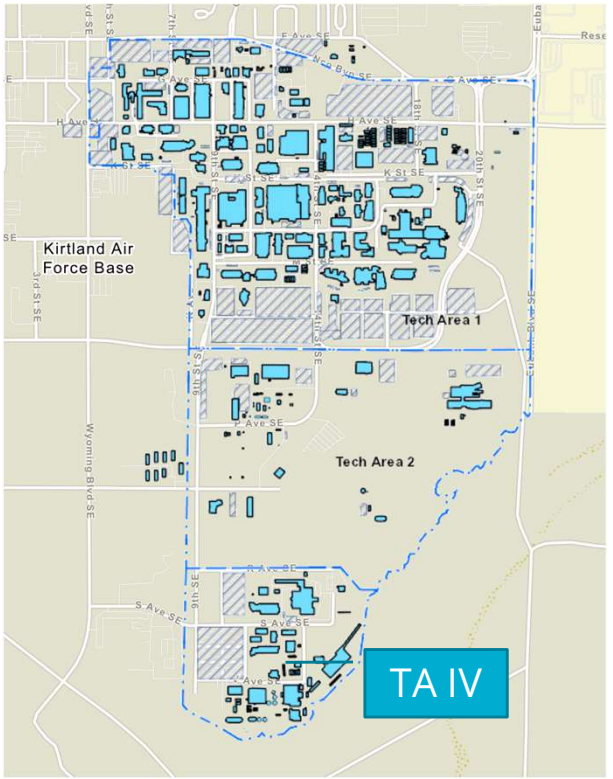
- Long Term Demolition
- Long Term Building
- Long Term Site

Key Plan

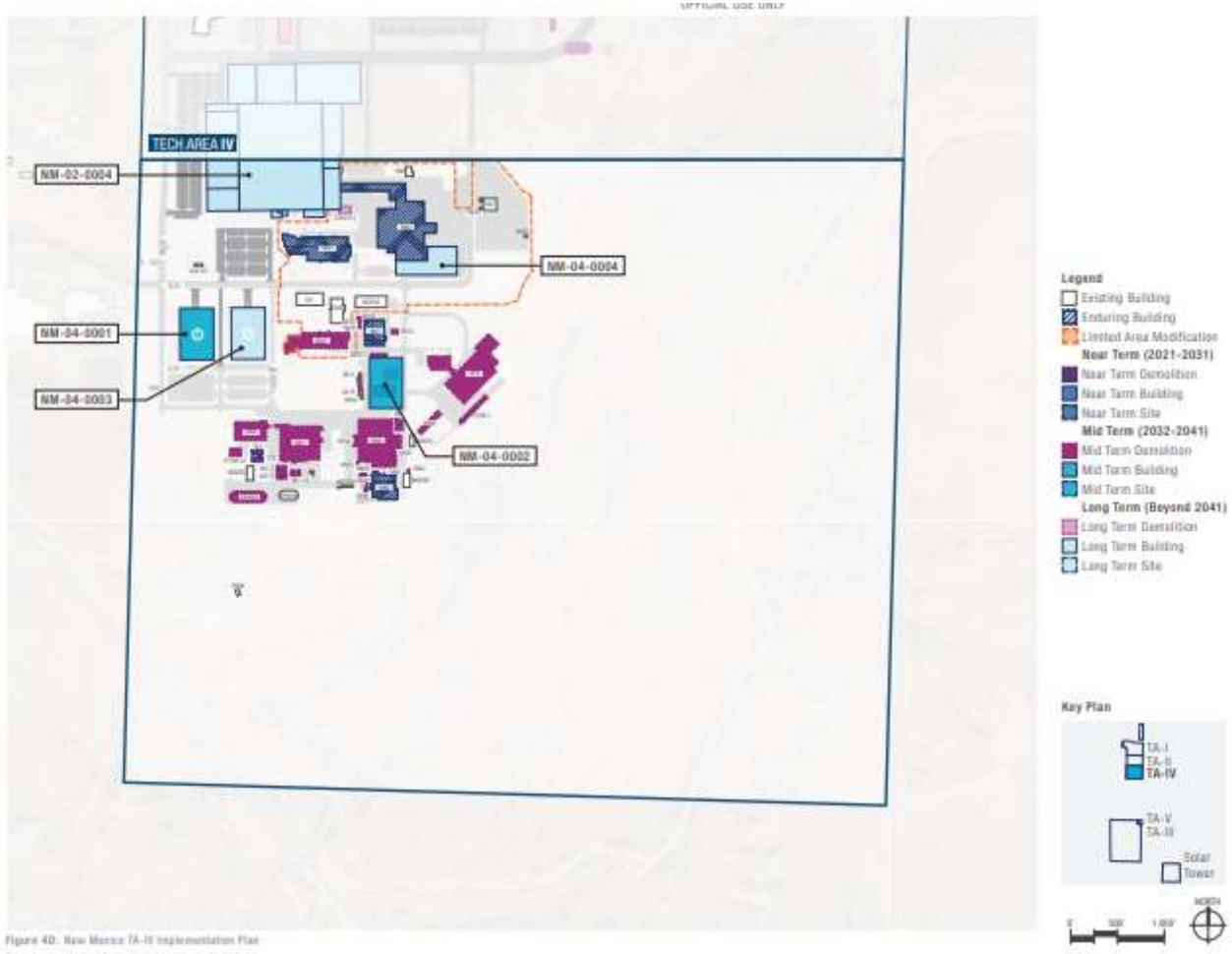


TA-IV

TA-IV is located directly south of TA-II. The site comprises a mix of laboratory and office facilities for scientific research and testing and designated open space in the adjacent Tijeras Arroyo. Development is structured around national security and accelerators' mission-related facilities and security programs



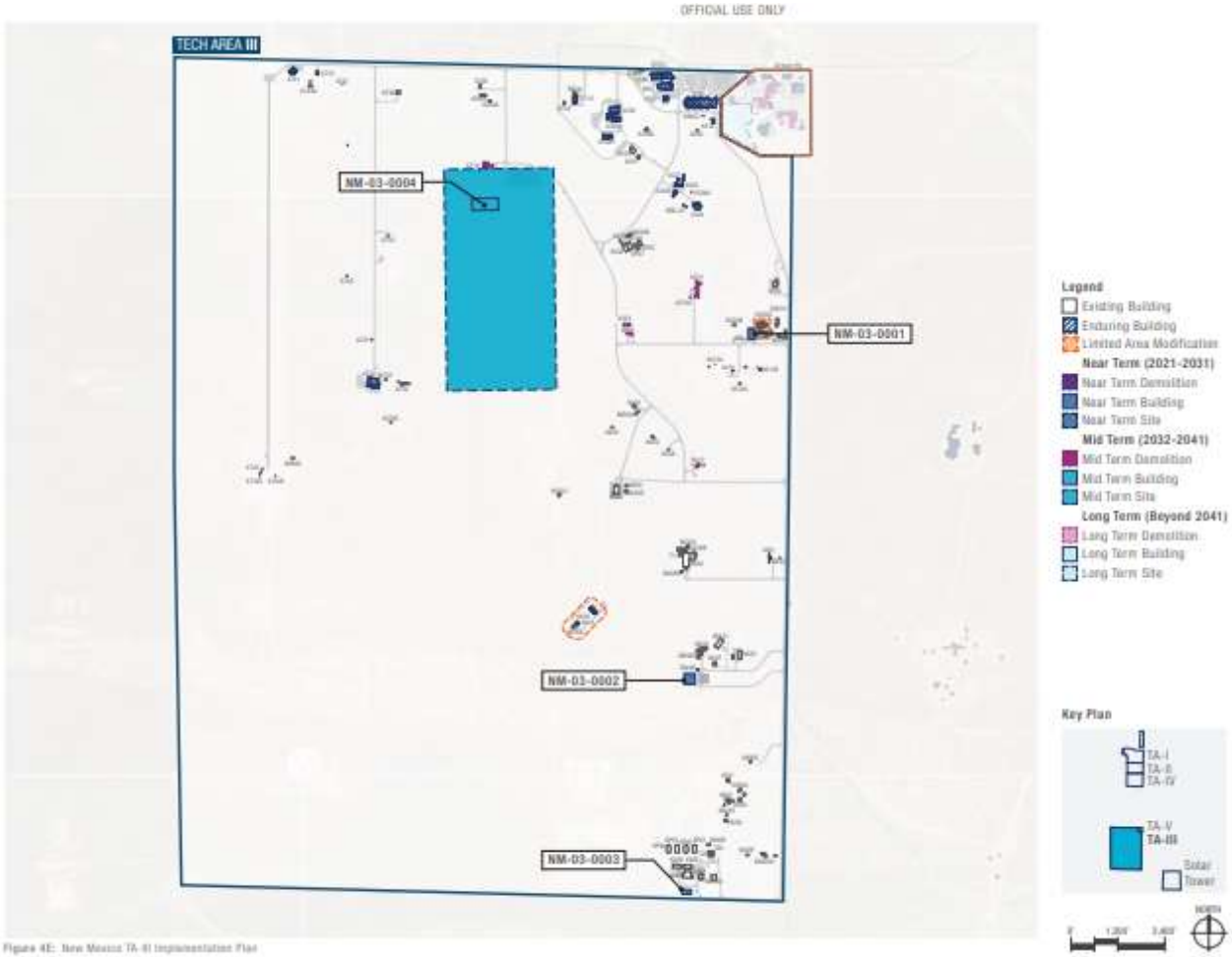
Site-Wide Master Plan – TA-IV Implementation Plan



TA-III

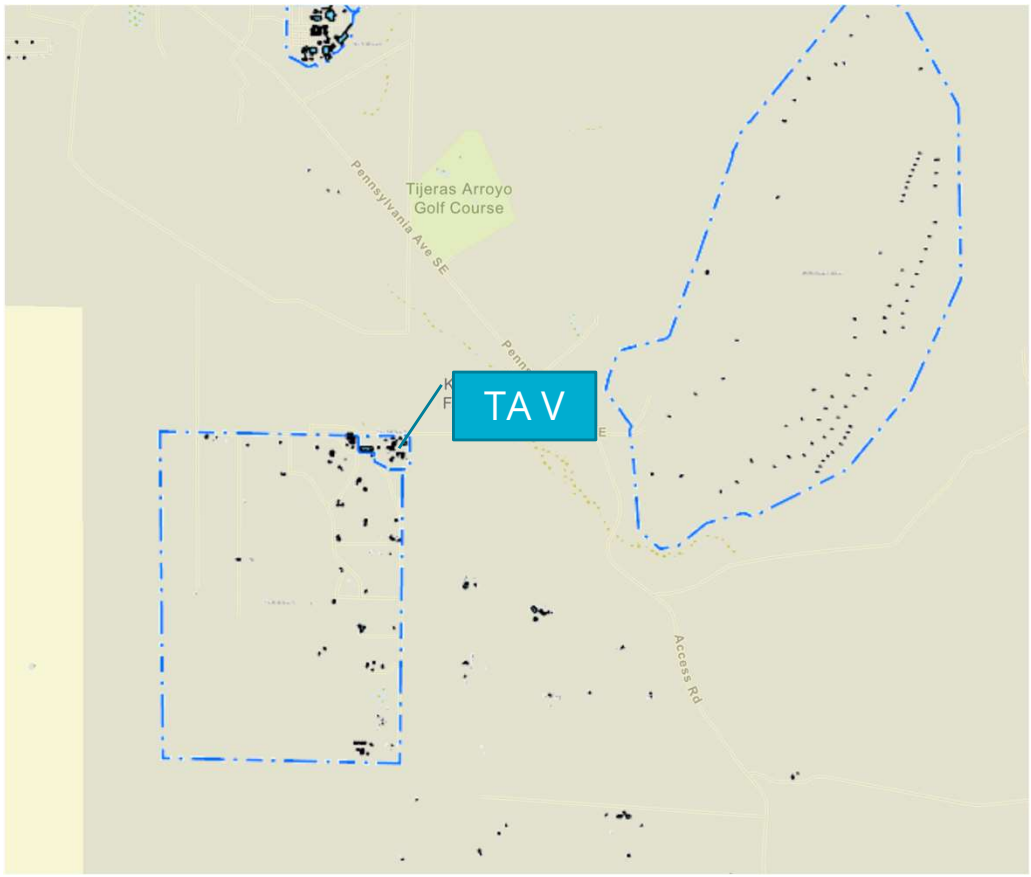
TA-III is the most remote of the New Mexico Tech Areas, located on the far southern boundary of the SNL/New Mexico campus. The area is utilized mainly as a remote testing site devoted to full-scale experiments, simulating various natural and induced environments. The area also includes several active and inactive waste facilities. TA-III is mostly a Property Protection Area with Limited Areas within the Property Protection Area (PPA). Monitoring and administrative facilities associated with remote testing are located at the northern portion of TA-III near the access gate to the Property Protection Area. The physical test sites are sited based on their unique hazard and buffer requirements.

Site-Wide Master Plan – TA-III Implementation Plan

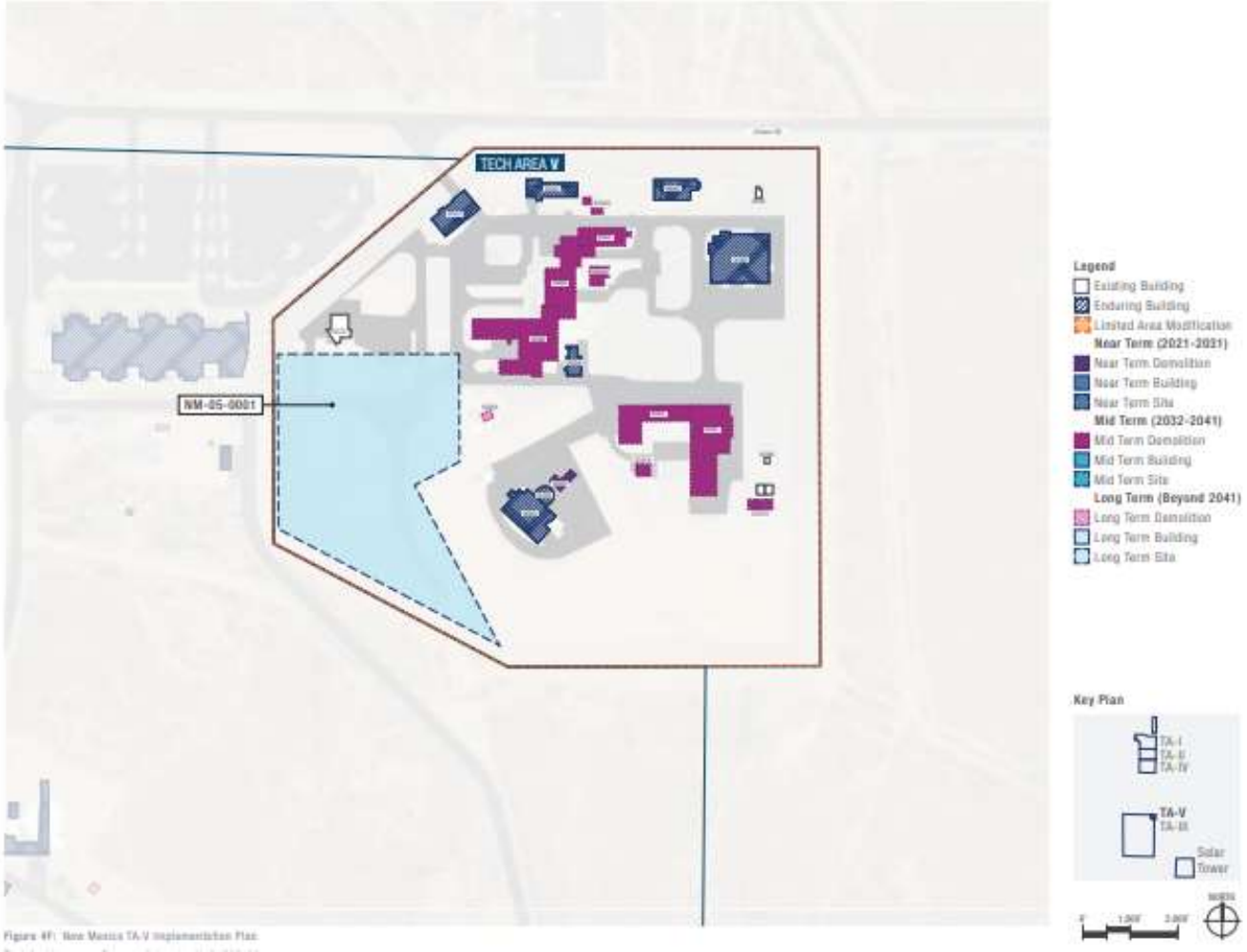


TA-V

TA-V is a remote, secure nuclear research and radiation effects testing site located northeast of TA-III.



Site-Wide Master Plan – TA-V Implementation Plan

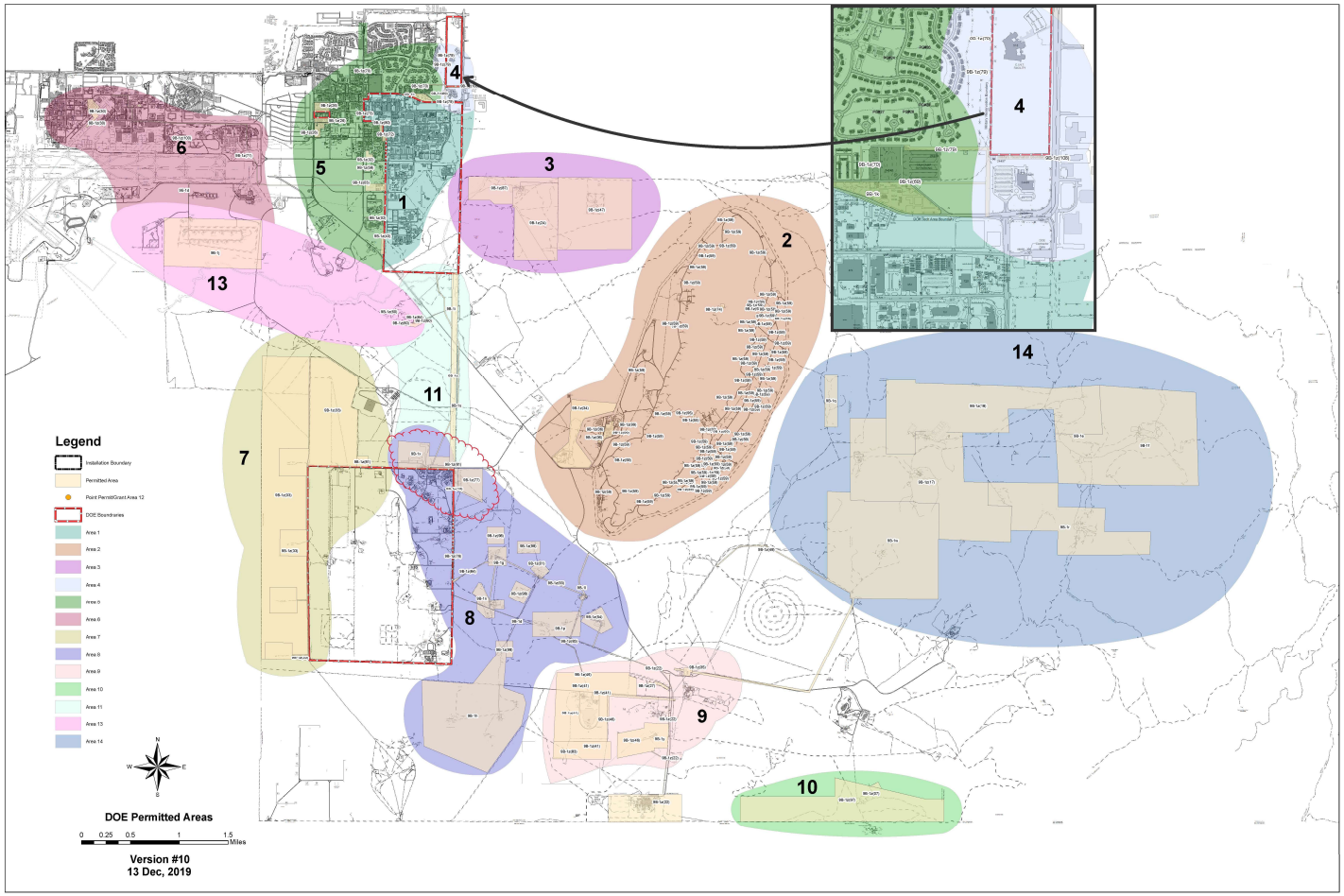


SNL Permits

SNL uses land use permits to provide additional land to meet mission needs outside of DOE owned land. Permits are effectively the same type of agreement as a land lease. However, NNSA uses the term “permit” when the agreement is between two federal agencies – ex. DOE/NNSA and Department of Defense (DOD)/Air Force. Most permits are for land only, with only a few permits for facilities.

In New Mexico, NNSA currently permits 6,280 acres of land and 403,937 square feet of facility assets from Kirtland Air Force Base (KAFB) for SNL use. These permitted areas are generally located in remote locations. Their use focuses on meeting mission needs for large-scale testing and accommodating operations that require a lot of land area in a remote location, which is distanced from dense population areas

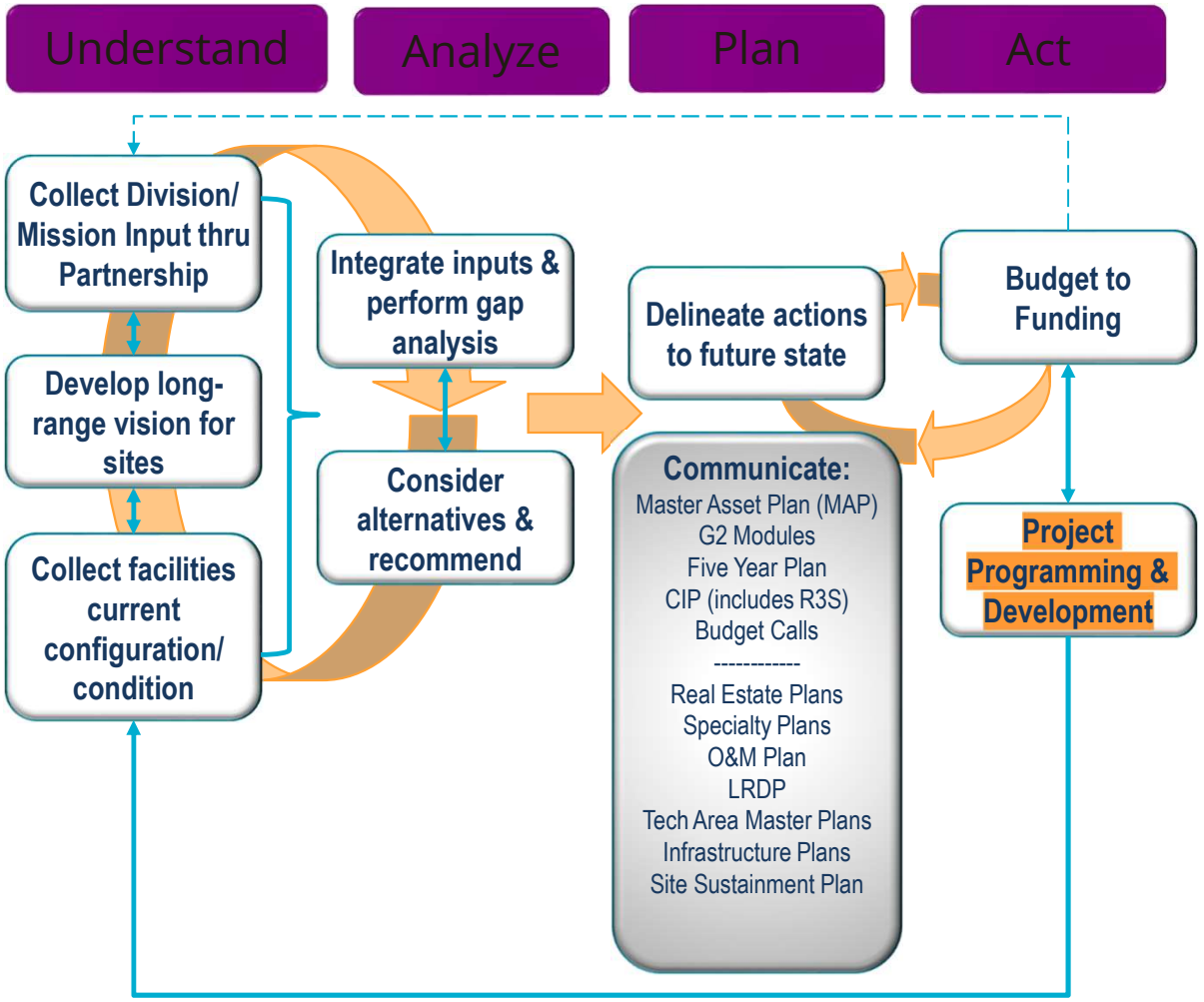
Permits with KAFB



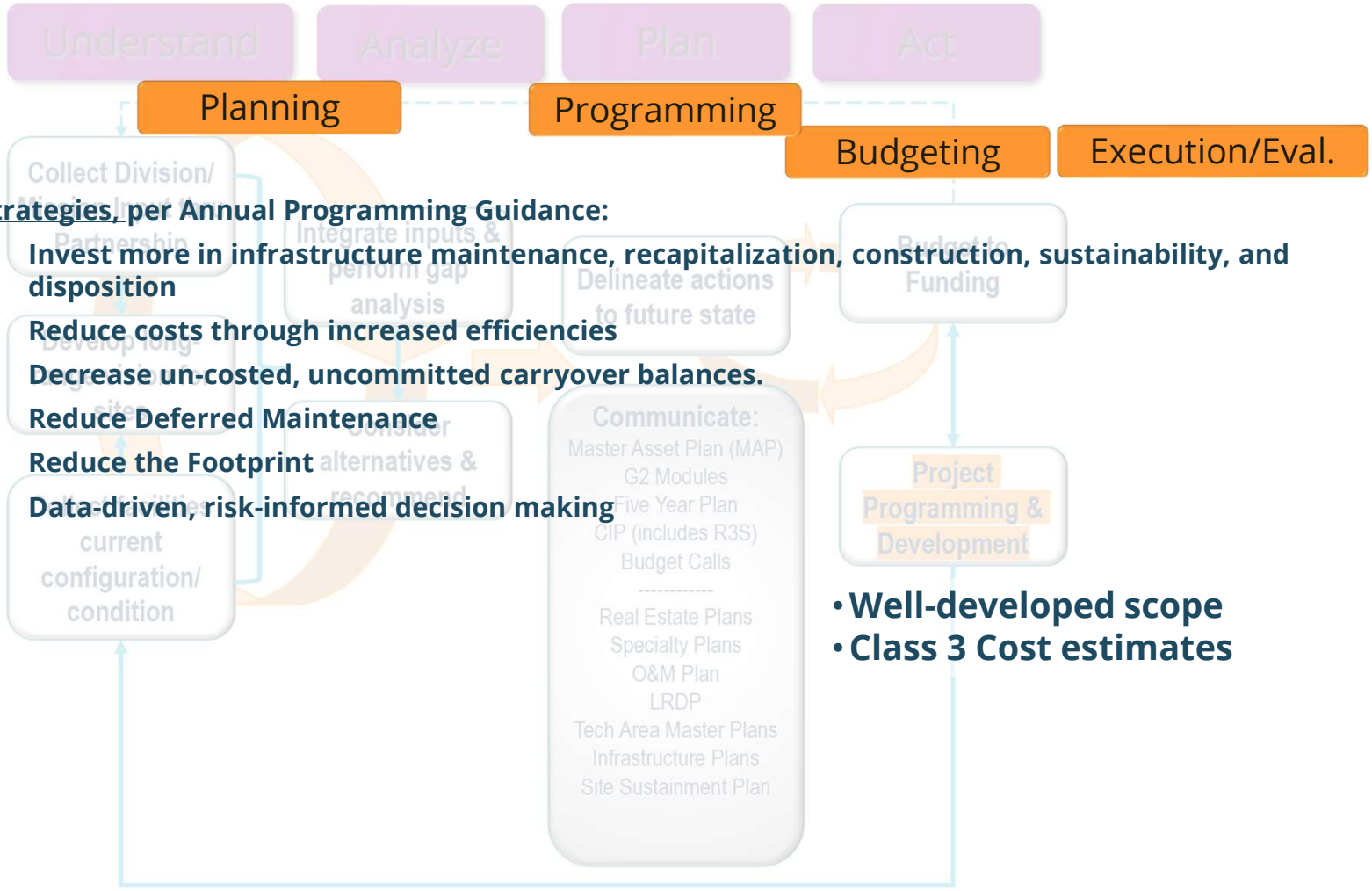
101 Permitted buildings

233,834 gross SF of permitted AF land

SNL Strategic Site Planning Process



SNL Strategic Site Planning Process

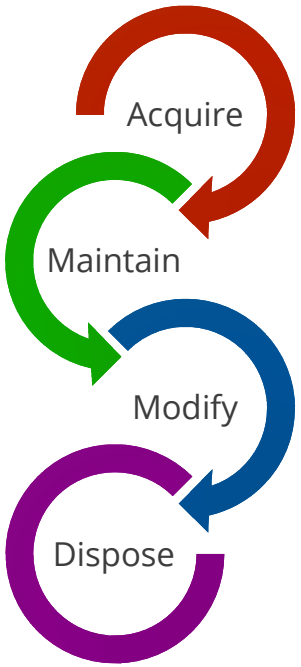


Strategies, per Annual Programming Guidance:

- **Invest more in infrastructure maintenance, recapitalization, construction, sustainability, and disposition**
- **Reduce costs through increased efficiencies**
- **Decrease un-costed, uncommitted carryover balances.**
- **Reduce Deferred Maintenance**
- **Reduce the Footprint**
- **Data-driven, risk-informed decision making**

- **Well-developed scope**
- **Class 3 Cost estimates**

Planning and Asset Lifecycle



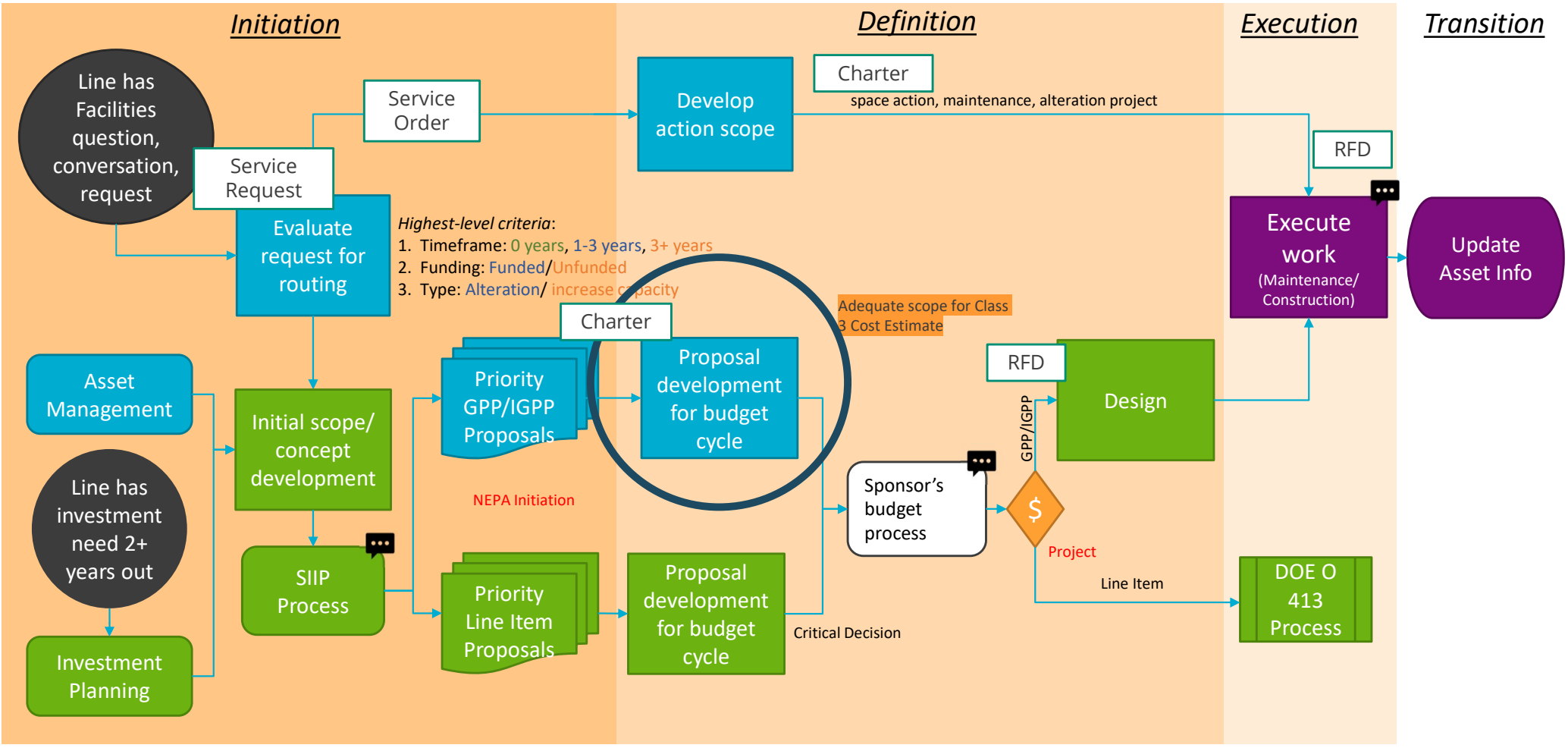
- Build – major & minor construction
- Purchase
- Lease

- Maintenance
- Operations
- Alterations/ Restoration

- Renovation/ Recapitalization (Extend life or change use)

- Demolition
- Transfer ownership

SNL Facilities Process Flow



Sandia Infrastructure Investment Planning Process (SIIP)

- Developed in FY20
- An approach to how Sandia identifies F&I investment needs to obtain funding
- One database - single source of truth for data related to Sandia related F&I needs.
- Principled process utilizing uniform scoring criteria driven by strategic direction
- Alignment of need to single best funding source

SIIP Process (Simplified)

SIIP Process (Lens)

Mission Needs and Planning Horizons

Strategic planning for **Mission Requirements** are aligned with Short-Term, Mid-Term and Long-Term ***planning horizons*** to respond to immediate & future mission needs, capability sustainment, site development patterns, and funding constraints. **Project Development** typically focuses on Mid-Term planning, but can involve and affect all timeframes.

Short-Term 1-2 Years
Meeting Current Mission Needs

- The short-term mission needs (1-2 years) are met within existing space, with leases and with minor modification and required moves

Mid-Term 3-5 Years
Enable Mission Capabilities

- The mid-term mission needs (3-5 years) are met with construction of GPPs, major renovations and new leases

Long-Term 5-10 Years
Sustainment of Mission Capabilities

- Long-term mission needs (over 5 years) are met with major facility and infrastructure investments in the GPP, Line Item and National Project funding range

Out Years
Sustainment of Enduring Mission Capabilities
Enable Future Science and Technology

- Strategic planning for the Out Years is based on Mission projections to meet current needs, address future programs and respond to emerging technology

What is Project Development?

What is Project Development?

A study that develops project scope to

1. Clearly define project design criteria and parameters.
2. Assess and document existing conditions.
3. Identify the preferred option/solution.
4. Typically results in a Budgetary (Class III) cost estimate.

Why Project Development?

1. Planning
   - Planning decision-making
   - Establishes project feasibility
2. Meet Requirements set by funding sponsors
   - Budgetary (Class III) cost estimate
   - Typically limited to 30% design

Project Development & APA Core Competency 7 - Management

Sub-elements

- **Decision-making,**
  - Design criteria/parameters & AoA/preferred option selection
- **Project management,**
  - SNL PD/PM & A/E PM
- **Intergroup and stakeholder relationships,**
  - Customer, SMEs, Project Team
- **Budgeting and financing, and**
  - Study effort budget, project costs estimated in Study vs. final project costs
- **Strategic planning**
  - Considering Site Master Planning (Levels A,B, and C), Real Estate Planning, Space Planning, and Strategic Investment Planning

Example Projects

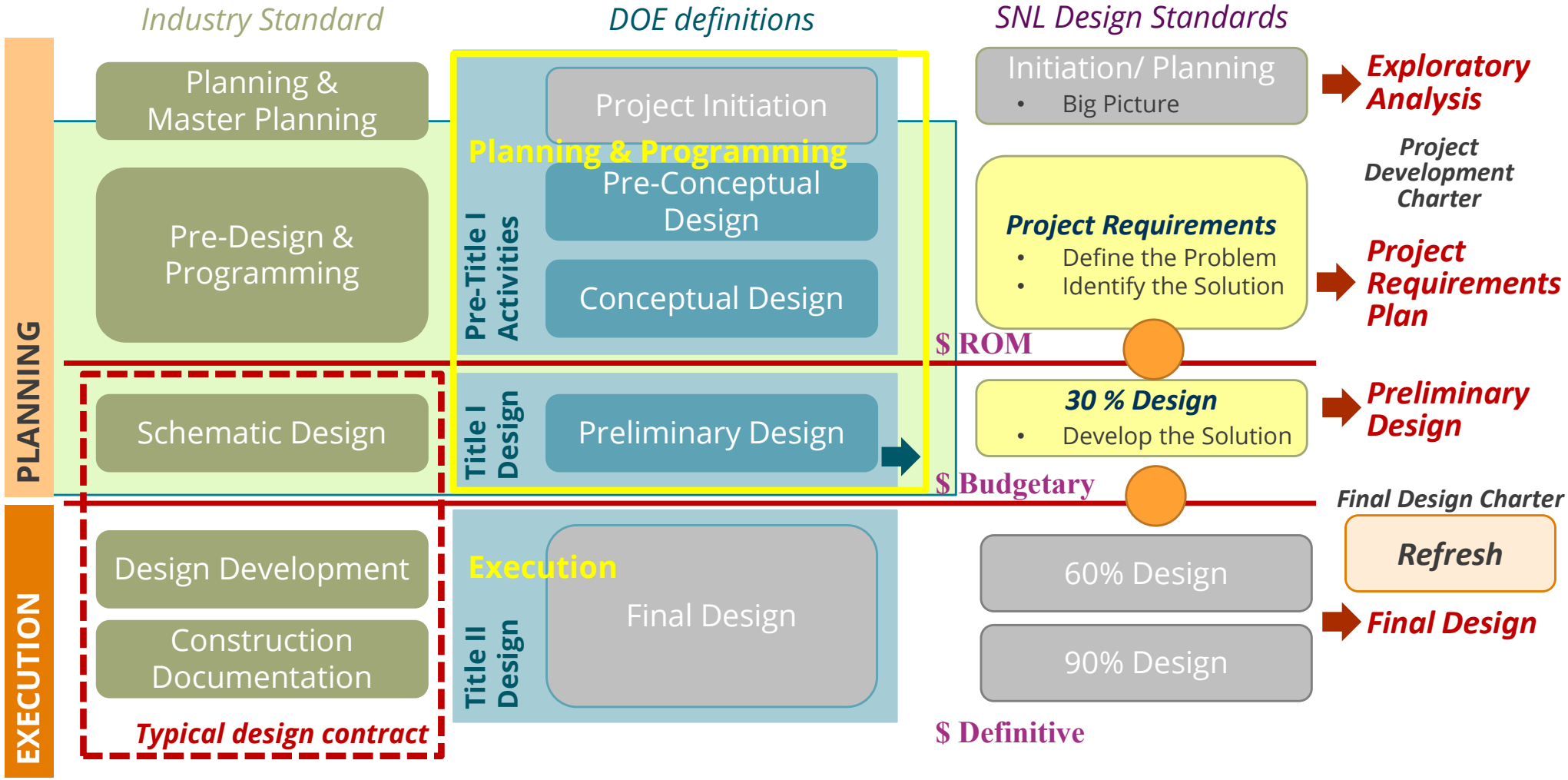
Maintenance Yard Master Plan

- 7.5 acre Maintenance Yard in TA-II
- Efficiently meet storage requirements to support mission needs
- Deterioration of materials due to inadequate storage structures

New Lab Facility

- Long-term lab for high bay, light electrical, and storage space.
- Vault Type Room spaces
- Accommodate existing and future needs

SNL-NM | Project Development for Minor Construction



SNL Planning Overview

	8000	4000	Study Type	Definition	Sub-Elements	Outcome
Planning	8540	4110	**Exploratory Analysis**	A study that looks at a broad set of undefined needs and/or gaps to formulate an investment strategy on a timeline to bridge the gaps.	N/A	▪ *A need/gap has been projectized.* ▪ *Project type(s) identified.* ▪ *A comprehensive investment strategy has been developed.* ▪ *A Statement of Strategic Intent has been documented.* ▪ *ROM (Class 5) costs established.*
			Project Development Charter			
		4850	**Project Development**	A study that develops project scope to achieve clearly defined criteria and parameters, assess and documents existing conditions, establishes a preferred solution, and typically results in a Budgetary (Class 3) cost estimate.	Project Requirements Plan	▪ *Project scope, criteria, and parameters are clearly defined.* ▪ *Existing conditions have been explored and documented.* ▪ *A preferred solution has been selected.* ▪ *ROM (Class 4) costs established* ▪ *Initial PRD is completed by A/E.*
					Preliminary Design	▪ *The preferred solution has been developed to provide sufficient information to initiate project execution, up to 30% Design.* ▪ *A Budgetary (Class 3) cost estimate has been established.* ▪ *PEP & PRC is completed* ▪ *30% Design PRD (updated).*
			Final Design/Construction Charter + PRD			
Exectution		4720	**Final Design**	*[Per Design Standards Manual]*	N/A	▪ *Construction Documents* ▪ *Class 1 cost estimate*

Project Transition to Project Development

Deliverables to be complete prior to Project Developer

When a project is funded for Project Development, the Program Planner

- Drafts the Project Development Charter, working with the Project Developer to review and revise.
- Provides a Statement of Strategic Intent.

Statement of Strategic Intent

Sufficient information is needed prior to development of a Project Development Charter to ensure

- Project Development is not delayed due to lack of scope clarity or critical information.
- The resulting Preliminary Design responds to the project intent.

Conceptual Statement of Strategic Intent

(information PDs and A/Es are not the decision-makers for)

- Who is the Program Planner for the project?
- Who are the Project Stakeholders and POCs?
- Who is/are the decision-maker(s) for this project?
- What is the strategic intent: What specifically does the project need to accomplish? The key here is knowing that if the project cannot achieve X, Y, and Z, it may not be viable or needs to be reconsidered.
- Is the project intended to be agile or designed to the requirements of a specific group?
- Identify the general space type characterizations, uses, and ROM building square footage.
- Identify users. If specific users will not be identified, then provide a well-developed characterization of the users.
- What will they be vacating? Information to be provided to the Strategic Space Planners.
- What are the security requirements, both in terms of GA/PPA/LA and any high security space needs.
- Are there any critical timeline considerations we need to be aware of for the project, aside from requirements set by the Project Development funding source?
- What is the project budget and are there any special funding considerations that have impact on the project?
- Has a site been selected?
- Links to existing related studies.

Project Development Submittals

1 Project Requirements Plan *(15%-30% effort)*

- Programming
- Existing conditions
- Design criteria
  - Preliminary PRD
- ROM costs / budget review
- Project Requirements Plan document

2 15% Design *(~60% effort)*

Note: Project managers are invited to design review meetings beginning at 15% design

- Evaluate design options
- Identify preferred solution
- ~15% design development for review
- Initiate PM engagement

3 30% Design Draft *(90% effort)*

- Up to 30% design development of preferred solution
- Class III cost estimate / budget review

4 30% Design Final *(Final)*

- Respond to/incorporate final feedback
- Update class III cost estimate if necessary
- 30% Design PRD
- Final document

1 Project Requirements Plan *(15%-30% effort)* - Overview

Define the Problem.

- Identify customer(s)' needs and objectives.
- Determine the nature and scope of the problem; what information is required to develop an informed solution to satisfy the Program mission requirements.
- Evaluate existing conditions.
- Collect and analyze data.
- Define expectations, establish benchmarks, and to uncover all of the functional issues that impact the project.
- Establish project criteria and design parameters
- Align with applicable campus masterplans.

Identify the Solution.

- Understand project feasibility.
- Explore alternatives and associated cost and schedule implications.
- Select the preferred option.

... is complete when project scope, criteria, and parameters are clearly defined; existing conditions have been explored and documented; and a preferred solution has been selected.

1 Project Requirements Plan *(15%-30% effort)* - Deliverables

1. Project Overview
   - Needs and impacts relating to Mission and sponsors
   - Project limitations, trade-offs, and assumptions
2. Program of space use needs
   - Space characteristics, functional and operational requirements; adjacencies; specialty finishes, fixtures, or fittings as required; and square footage requirements.
   - Conceptual design diagrams
3. Design Strategy
   - Design strategy options
   - Preferred option
4. Construction criteria
5. Utility and infrastructure systems design criteria
   - Mechanical, electrical, plumbing (MEP)
   - Fire protection
   - Data and communications
   - Security systems
6. Preliminary building code analysis
7. Site selection criteria
8. Establish preliminary building size

Preliminary Design - Overview

2. **15% Design** *(~60% effort)*
3. **30% Design Draft** *(90% effort)*
4. **30% Design Final** *(Final)*

1. Develop the preferred option to a level approaching 30% design.
2. Provide sufficient information to initiate project execution.
3. Establish a Class III cost estimate.
4. Provide a draft project schedule or phasing plan if applicable.

For Civil, Structural, Architectural, Fire Protection, Mechanical, Electrical, and Telecommunications Design Deliverables, refer to Sandia National Laboratories/New Mexico Design Standards Manual, Section 2.5.1.2 30 Percent Design Requirements

Preliminary Design is complete when the preferred solution has been developed to provide sufficient information to initiate project execution, and a Class III cost estimate has been established.

Preliminary Design - Deliverables

2 15% Design *(~60% effort)*
3 30% Design Draft *(90% effort)*
4 30% Design Final *(Final)*

Example for New Footprint

1. Outcome of Value Engineering/ Scope Risk Analysis
2. Site Development Plan
   a. Site analysis
      - Siting for the facility(s) per the SNL Conceptual Location Analysis process
      - Existing utilities location, condition and capacity analysis
      - Hazard Arcs: Explosive Site Plans and permits
      - Flood hazard analysis
      - Code analysis
      - Site survey / Geotech Report

   b. Site Plan
      - Building footprint location and orientation
      - Conceptual site circulation and parking
      - Conceptual landscape design
      - Grading and drainage / GI/LID
      - Schematic site utilities
3. Building Design approaching 30%
   a. Floor plans and elevations
   b. Conceptual structural system
   c. Building and/or wall sections
   d. Schematic building utility and infrastructure systems.
   e. Submittals of equipment for energy modeling.
      - Mechanical, electrical, and plumbing (MEP)
      - Fire Protection
      - Data and communications
      - Security systems
   f. Facility 3D renderings.
4. NEPA documentation
5. Energy Analysis
   3. Energy Code Analysis
   4. Energy model analysis
6. Guiding Principles/LEED Checklist
7. Draft project schedule or phasing plan if applicable
8. Class III Cost Estimate

Project Development Requirements

A Budgetary (Class III) estimate is

Required if:

- The project requires Congressional Notification.
- The project is funded through NA-50 Recap.
- Is a D&D project.

<u>Not</u> required if:

- The project is indirectly funded and <$5M.
- The project is a sustainment (non-capital) project that is not funded by NA-50 Recap.
- It is managed through the L-CAMPS
  - Unless ≥ $5M TEC and is either a capital project or will be funded by NA-50 Recap.

Project Development is limited to <30% Design if

- The project requires congressional notification.
- There is a possibility of changing direct/indirect categorization of funding sources.

Best practice is that *all* projects have a Class III cost estimate or better.

Cost Estimating Classifications

DOE Estimates (using AACE International Cost Estimate Classification System)					DOE Common Terminology PPDS	Sandia Equivalent
	Primary Characteristic	*Secondary Characteristic*				
Estimate Class	**Maturity Level of Project Definition Deliverables** Expressed as % of complete definition	**End Usage** Typical purpose of estimate	**Methodology** Typical estimating method	**Expected Accuracy Range** Typical variation in low and high ranges	**Cost Estimating Classification**	**Cost Estimating Type** Typical Bounds of Estimate
Class 5	0% to 2%	Concept screening	Capacity factored, parametric models, judgment, or analogy	L: -20% to -50% H: +30% to +100%	Order of magnitude	ROM (-30% to +50%)
Class 4	1% to 15%	Study or feasibility	Equipment factored or parametric models	L: -15% to -30% H: +20% to +50%		
Class 3	10% to 40%	Budget authorization or control	Semi-detailed unit costs with assembly level line items	L: -10% to -20% H: +10% to +30%	Preliminary	Budgetary (-15% to +30%)
Class 2	30% to 75%	Control or bid / tender	Detailed unit cost with forced detailed take-off	L: -5% to -15% H: +5% to +20%	Definitive	Definitive (-5% to +15%)
Class 1	65% to 100%	Check estimate or bid/tender	Detailed unit cost with detailed take-off	L: -3% to -10% H: +3% to +15%		Unlikely to be used

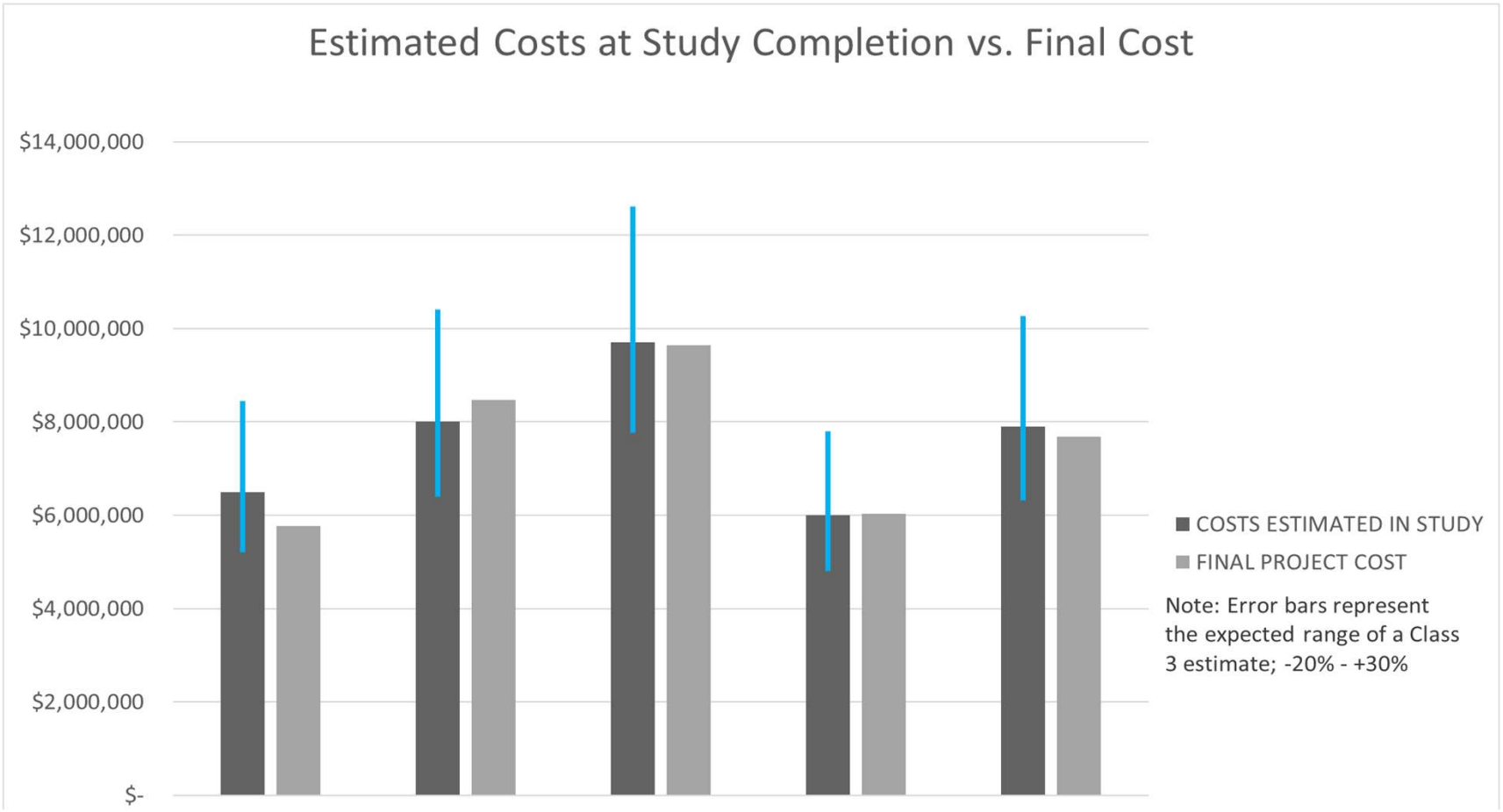
DOE: Class III: -20% to +30%

or

SNL: Budgetary: -15% to +30%

PPDS-DOC-0154
Revision A

Estimated Costs at study completion vs. Final Cost



Project Development: Cost Impacts | Strategies

Information flow-down | Charter improvements

- *Identify users early to best support the accuracy of project requirements.*
- *Customer equipment detail requested early.*

Scope Development | Project Req's Plan

- *Increased level of programming detail.*
  - *Address A/E's thinking "They'll figure it out in Design".*
- *Comprehensive decision-making.*
  - *Preferred option is identified in Project Development.*

Budgetary estimates | 15% -30% Design in PD

- *Estimate is the outcome of more complete information.*
- *Budgetary/Class III = -15% to +30% accuracy.*

Critical process timelines | NEPA process improvements TBD

- *Reduce time required for NEPA checklist*
  - *Allow potholing, geotech etc. during PD.*
  - *Reduce unanticipated costs during Final Design.*

A/E continuation after PD | In Discussions w/ PMs & Procurement

- *Retain knowledge history of decision-making basis.*
- *Avoid transfer of project liability.*
  - *New A/E's revisit design, repeating 30% Design.*
  - *Redesign impacts costs and bandwidths.*

Information continuity | Increase overlap PD through Final Design for PPs/PDs/PMs

- *Increased cross-department involvement throughout Project Development.*
- *Improved communication of project history.*

Project planning timeline | Refresh process

- *Evaluate current relevance of a completed project study*
  - *Assesses changes in mission need.*
  - *Assesses changes in codes or agency requirements.*
- *Cost estimate is reviewed and brought current*
  - *Inflation and escalation factors.*
  - *Supply chain issue impacts.*

Summary of Strategies

Strategies to improve performance

- Statement of Strategic Intent
- Charter Improvements
- PPs, PDs, and PMs expanded partnership
- Project Requirements Plan
- 15%-30% Design in Project Development
- PRD in Project Development
- Review/Refresh process
- Agreed language: “Budgetary” cost estimate

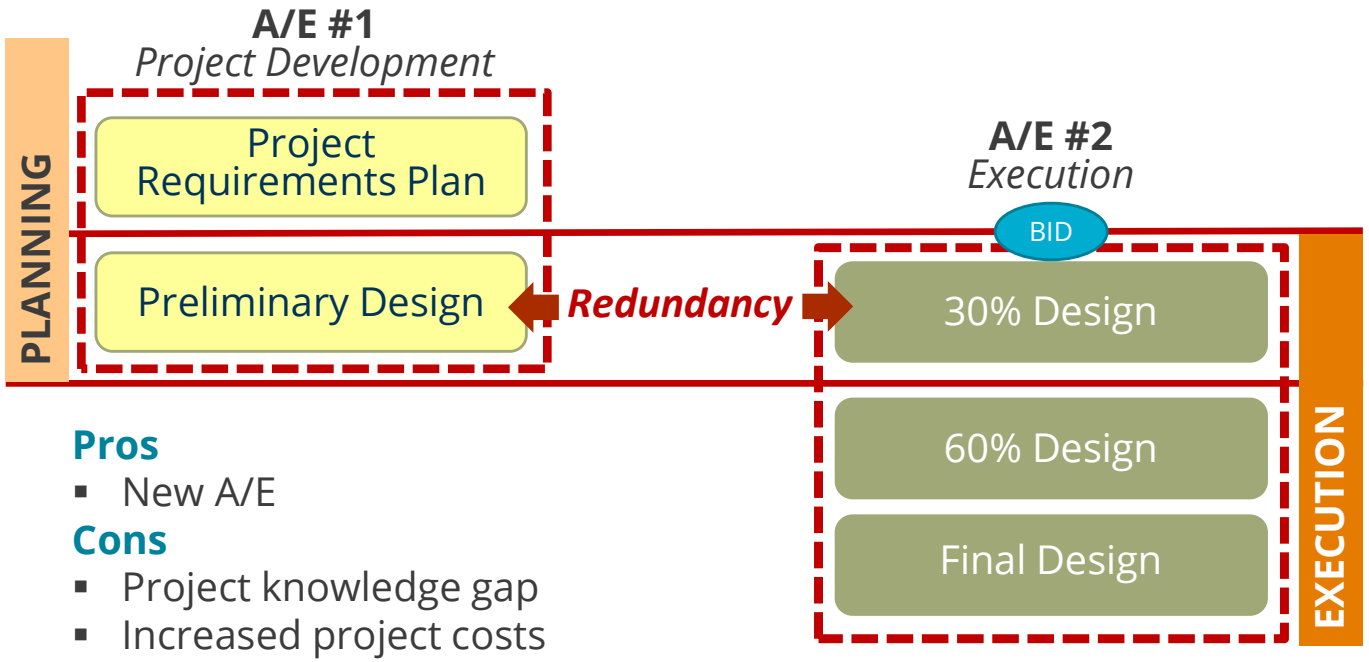
Continued discussion

- Metrics
  - Bandwidth
  - Funding
  - Costs
  - Time per project type
- Option for one A/E for Project Development and Execution
- NEPA process improvement
- NA-90 Recap requirement

  ”… the 95% Confidence Level must be used to establish the amount of Contingency…”

TBD: Barriers to retaining an A/E throughout a project

15%-30% design needed to produce Class III



30% design revisited for liability

Pros

- New A/E

Cons

- Project knowledge gap
- Increased project costs
- Taxes A/E bandwidth
- Taxes PM bandwidth
- Change of liability

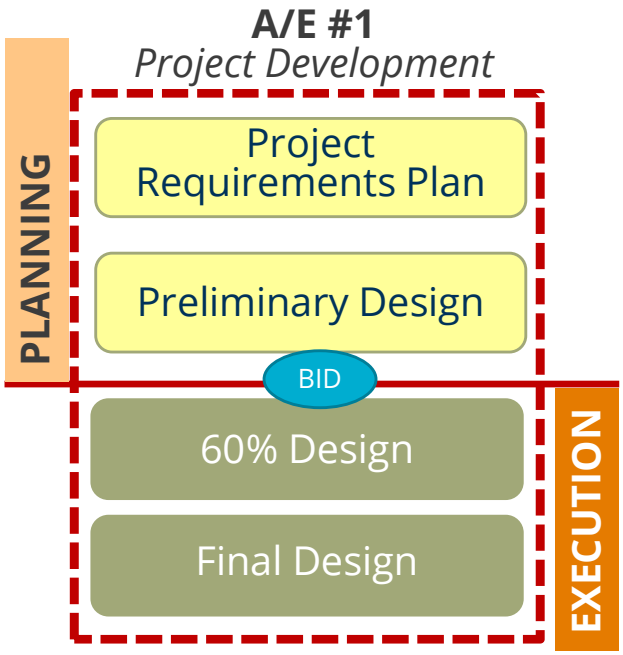
TBD: Barriers to retaining an A/E throughout a project

Pros

- Project knowledge maintained
- Improved project efficiency: cost & execution schedule
- A/E bandwidth relief
- PM bandwidth relief
- Same A/E responsible for fidelity of cost estimates
- No change of liability

Cons

- None



No change of liability

Project Transition to Execution

Project Development Deliverables to Project Managers

At completion of Preliminary Design:

- A/E will update the PRD to reflect final PD Design basis.
- Project Developer will
  - Add overhead costs by completing the Project Execution Plan (PEP).

When project is funded for Execution:

- Design Charter is drafted by the Project Developer for both Final Design and Construction.
- Cost estimate is reviewed and updated with the PRD.
- The Project Developer reviews and validates the PRD with the stakeholders.
  - Minor Changes = proceed with execution.
  - Significant Changes = additional project development needed.

Project Development Refresh

Minor Changes *(proceed with execution)*

Project Developer will document and review changes with the Project Manager, who will determine if they are minor and can be addressed during design.

If the changes are minor, the updated scope is included in the Scope of Work for the Design Charter and the PRD is updated.

Examples

- Requirement / code update
- Additional equipment / new interior layout
- Cost increase under funding threshold

Significant Changes *(needs additional project development)*

Level 1: Triggers a Project Development Refresh

- May require additional funding from Sponsor

Level 2: Triggers a new study

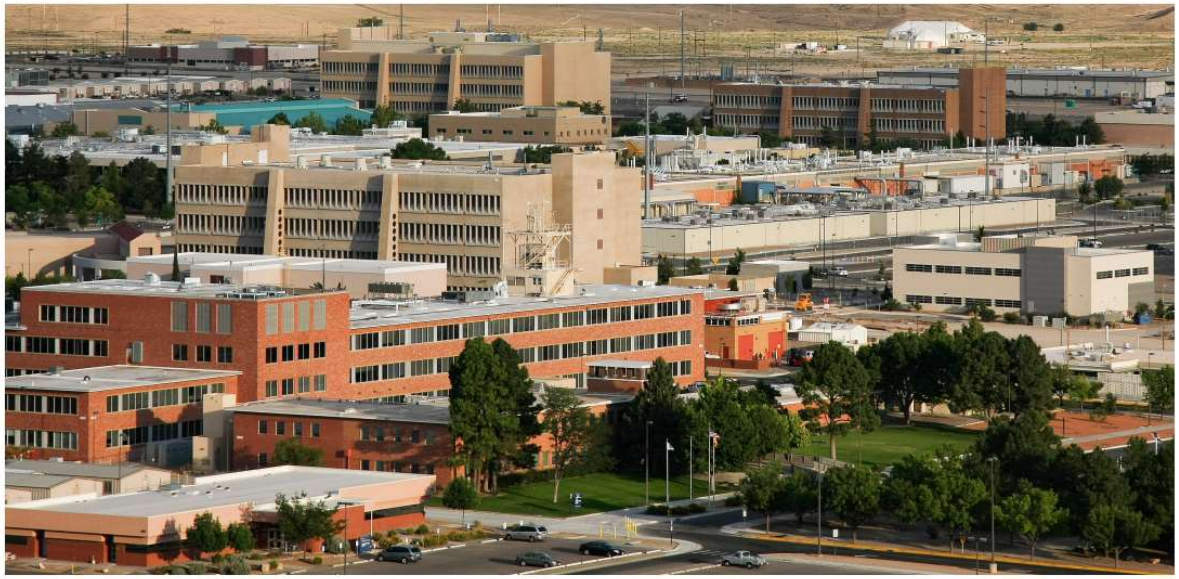
Examples

- Significant programming changes due to
  - Cost increases triggering need for scope evaluation and value engineering
  - Urgent shift in mission strategy
- Changes in directives/ code updates/ Base Support Agreement/ Service Level Agreements
  - May impact cost beyond -15% to +30%
- Site location has changed

Change Control Board			
Change Control Board	Contact Name	Organization	Phone Number
Sponsor	Click here to enter text.	Click here to enter text.	Click here to enter text.
Customer	Click here to enter text.	Click here to enter text.	Click here to enter text.
Facility Portfolio Manager (FacPM)	Click here to enter text.	Click here to enter text.	Click here to enter text.
Project Manager	Click here to enter text.	Click here to enter text.	Click here to enter text.

The Change Control Board —also referred to as Stakeholders—is established in the Project Charter

New Lab Facility



This Study developed a single general plant project (GPP) long term laboratory solution.

General plant projects are limited to budget requirements (now $25M Total Project Cost, TPC) and therefore limited in square footage.

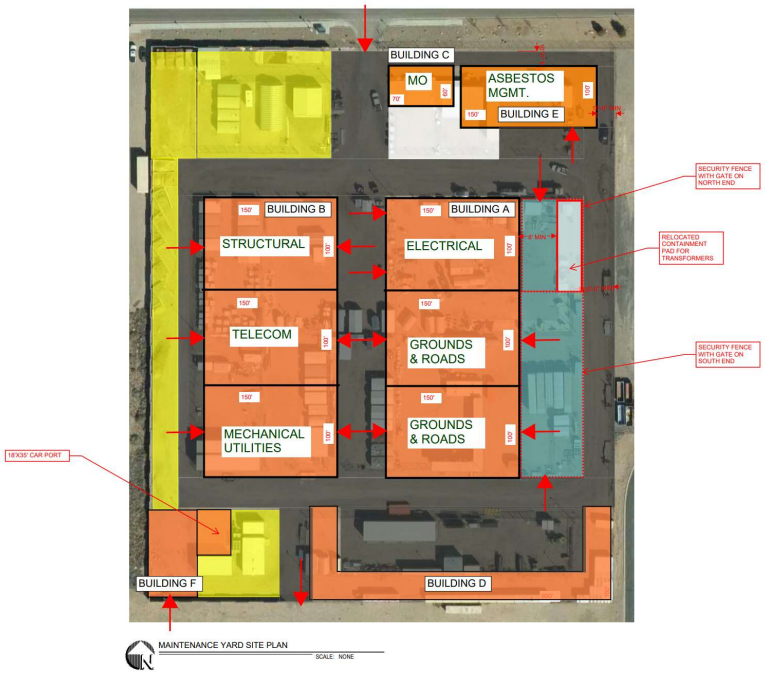
The Nuclear Deterrence (ND) space requests were greater in total square footage than a single GPP solution.

This study only included an investment strategy for one single GPP solution to meet a portion of ND space needs.

Lessons Learned and Value of Project Development:

- Statement of Strategic Intent: Is the project intended to be agile or designed to the requirements of a specific group?
- Project Requirements Plan clearly defines what the needs are and what is being met by the proposed facility.
- Refresh process ensures needs are valid when the project is funded for design/execution

Maintenance Yard Master Plan



Lessons Learned and Value of Project Development:

- Project Requirements Plan clearly defines what the needs are (existing space utilization and future storage needs) and how to efficiently plan for future space allocation.
- Effort ties to Real Estate Planning (potential for consolidating storage space) and long-range space planning (opportunity for non-facilities user groups to find and relocate to other on-site locations).
- Site Mod Review ensures SME concurrence with proposed development.

Conclusion

This session is intended to describe the value of planning for successful execution of facility and infrastructure projects.

What did we even talk about?

Recap:

1. "The Base"! Who, What, Where

2. Starting with big picture, long-range planning and diving into high-level Strategic Planning at SNL.

3. What is Project Development (pre-design and programming through schematic design) and why do we do it?
   a. APA Core Competency 7 – "Management" and sub-categories of decision-making, project management, intergroup and stakeholder relationships, budgeting and financing, and strategic planning.


Thank you

What does NOT need to go through Project Development?

A project does not need to go through Project Development if either

- The project TEC <$500K (FE/CFE)
- All of the following criteria have been met
  1. A Class III cost estimate is not required prior to exceeding 30% design, or it already exists for the project.
  2. The project scope, criteria, and parameters are clearly defined.
  3. Existing conditions are understood.
  4. A preferred solution has been selected.
  5. A Design Charter and Project Requirements Document (PRD) can be fully drafted.

1. DETAILED PROJECT-SPECIFIC REQUIREMENTS

A. CUSTOMER
B. ENVIRONMENTAL, SAFETY & HEALTH (ES&H)
C. SPACE MANAGEMENT
D. ARCHITECTURE

(Note: For building remodels, see 2009 IEBC, Section 605.2, where up to 20% of construction cost may be required towards providing an accessible route.)

A. SITES PLANNING/INFRASTRUCTURE
B. MECHANICAL
    1. Commissioning
    2. Water Treatment
C. FACILITIES CONTROL SYSTEM (FCS)
D. STRUCTURAL
E. SAFE BY DESIGN INTENT (OPERATIONS AND MAINTENANCE)
F. FIRE PROTECTION
G. ELECTRICAL
H. COMMUNICATIONS
I. VIDEO CONFERENCING
J. SECURITY
K. NEPA

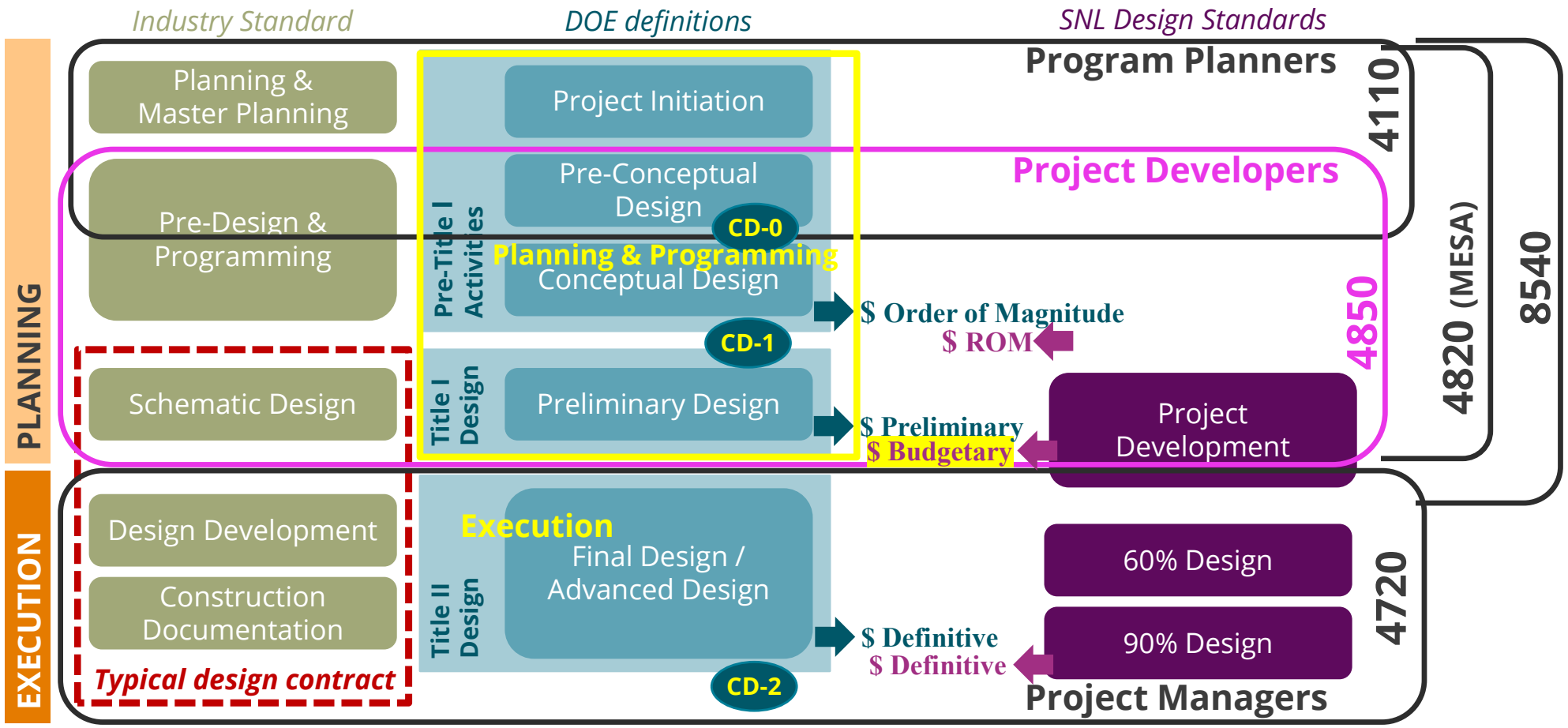
1. DELIVERABLES

A. NUMBER AND TYPE OF DESIGN REVIEW(S), REPORTS, DELIVERABLES, DESIGN COMMISSIONING PLAN
B. THE XX% SUBMITTAL SHALL INCLUDE: <*SPECIFY ACTUAL SUBMITTAL REQUIREMENTS IF DIFFERENT FROM SECTION OF FACILITIES DESIGN MANUAL*>.
C. FINAL SUBMITTAL EXPECTATIONS

1. QUALITY ASSURANCE REQUIREMENTS

A. CITE QUALITY PLAN/CRITERIA TO BE MET (ONLY IF SPECIAL TO THE PROJECT)
B. CITE ACCEPTANCE CRITERIA (ONLY IF SPECIAL TO THE PROJECT)

SNL-NM | Project Development for Minor Construction



Cost Estimate Types per Project Development effort

			Types of Studies	Planning: Exploratory Analysis	Planning: Project Development: Project Requirements Plan	Planning: Project Development: Preliminary Design	Execution: Final Design: Final Design: 60%	Execution: Final Design: Final Design: 100%	Execution: Final Design: Final Design: Post Bid
8500	4100	Program Planners	Line Items	ROM	ROM	Class III	Class III	Class II	Class I
			Corporate Space Planning	ROM					
			Master Plans	N/A					
			Lease	ROM					
			Exploratory Analysis	ROM					
	4800	Project Developers*	Minor Construction		ROM	Class III			
			PRD for leases		ROM				
			D&D		Class III				
		FAM	MESA	ROM	ROM				
	4700	Project Mgrs.	MESA			Class III	Class III	Class II	Class I
			Minor Construction				Class III	Class II	Class I
			Do not require PD			Class IV	Class III	Class II	Class I

** The FAM is included in the PD process as a stakeholder*

What is a Capital Project?

What is a Capital Project?

Partial requirements

- Costs > $500K
- Has an expected useful life ≥ 2 years
- Sandia will retain ownership
- Is characterized as a betterment
  - an improvement to the facility that results in better quality, higher capacity, greater energy efficiency, and extended useful life, or work required to accommodate regulatory or other requirement changes.
  - Increases capacity > 40%

(DOE Financial Management Handbook, Chapter 10 - Accounting for Property, Plant, and Equipment)