



Proposed Water Quality Lab Upgrades

Engineering and Operations Committee

Item 6c

January 10, 2022

Outline

- Water Quality Background
- Project Drivers
- Rigorous Project Planning
- Recommended Approach



Water Quality Lab – An Essential Facility

- Compliance monitoring and testing
 - Bacteria, disinfection byproducts
 - Metals and minerals, organic chemicals
- General water quality monitoring
 - pH, temperature, turbidity, alkalinity
- Distribution system integrity
 - Shutdowns and repairs/maintenance
 - Nitrification monitoring (nitrite, ammonia)
- Customer satisfaction
 - TDS, taste & odor, color
- Applied research
 - Emerging contaminants, treatment processes, analytical methods, alternative source waters



Essential Monitoring and Analysis

- Routine analysis
 - ~70,000 samples/year
 - 266 analytical procedures
 - 300,000 - 350,000 analytical results per year
- Samples from Metropolitan's entire system
 - Treated water distribution system
 - Treatment plants
 - Lakes and other source waters
 - Pipelines, facility shutdowns, and repairs
- 102 staff
 - Chemists, Microbiologists, Limnologists, Engineers, Biologists, Lab Technicians, Quality Assurance, Data Management, Business Support
- \$30M annual budget

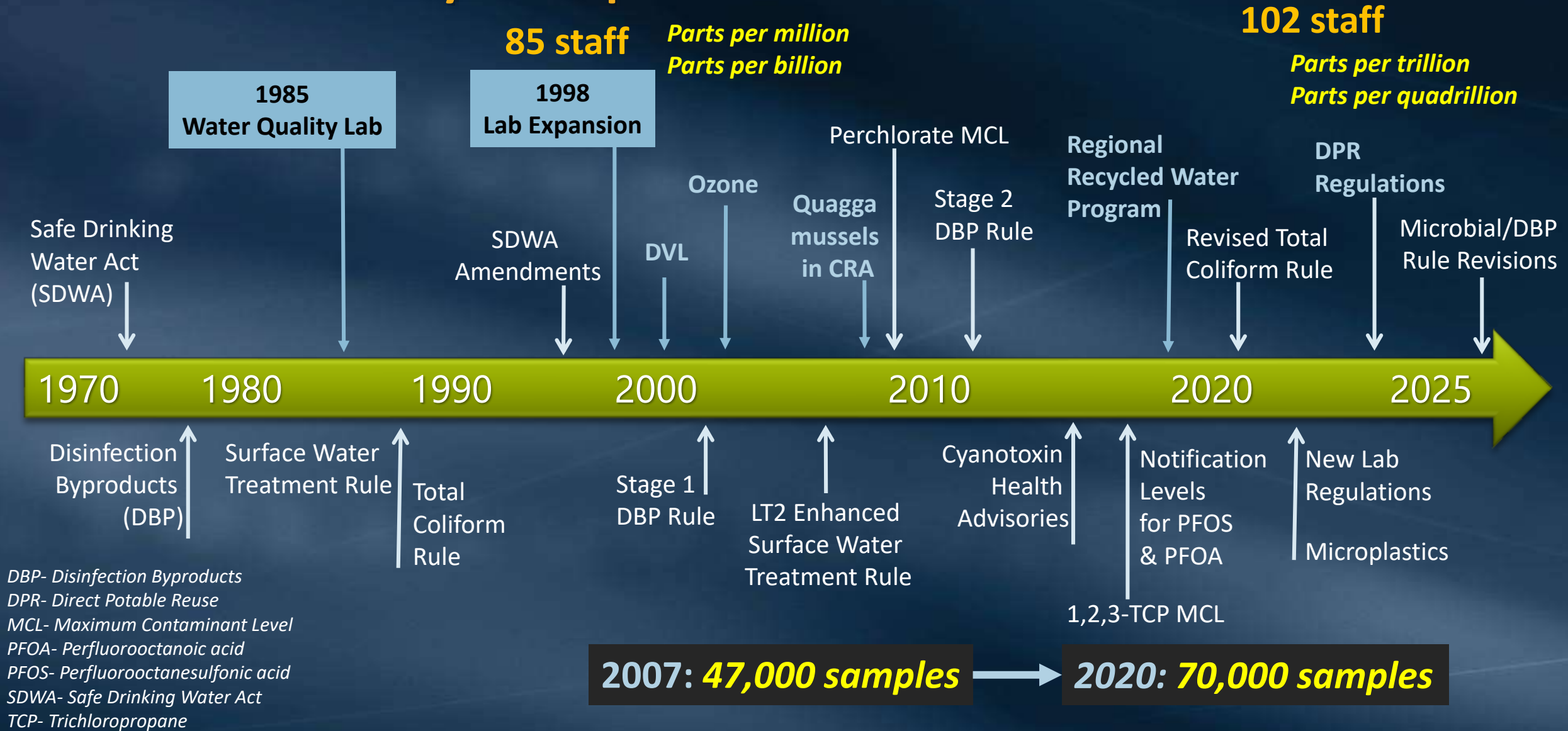


Innovation & Leadership in Water Quality

- Nitrification
- Ozone disinfection
- Treatment processes
- Cryptosporidium
- Nitrosamines
- Disinfection byproducts
- Flavor Profile Analysis
- Cyanotoxins
- Water reuse



Water Quality's Expanded Functions



Water Quality Challenges

New and Revised Regulations

- New lab accreditation
- Revised Total Coliform Rule
- Revised Microbial/DBP Rules

New and Emerging Contaminants

- 1,2,3-TCP
- PFAS, Microplastics
- Pharmaceuticals
- New disinfection byproducts

Low Flow in Distribution System

- Nitrification
- Coliform regrowth
- Corrosion control

Lakes and Source Waters

- Taste and odor
- Cyanotoxins
- Stratification and anoxia
- Invasive quagga mussels

Recycled Water Program

- Detecting and removing contaminants
- Blending strategies
- Direct potable reuse

Current Building Limitations

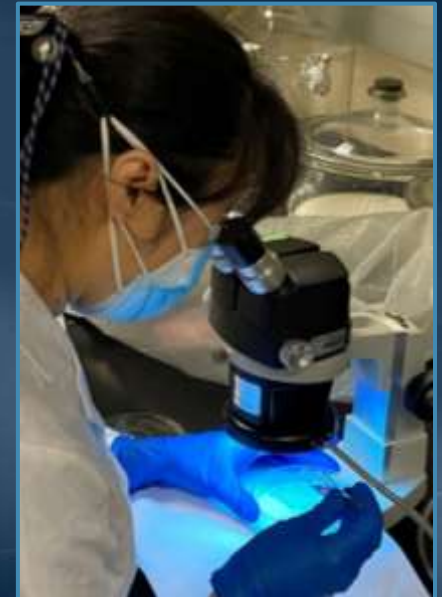


- Spaces fully utilized or beyond capacity
- Lab spaces open to common areas
- Overlap between office and lab spaces
- Staff cubicles in corridors
- Under-utilized and inefficient spaces
- Inadequate record storage

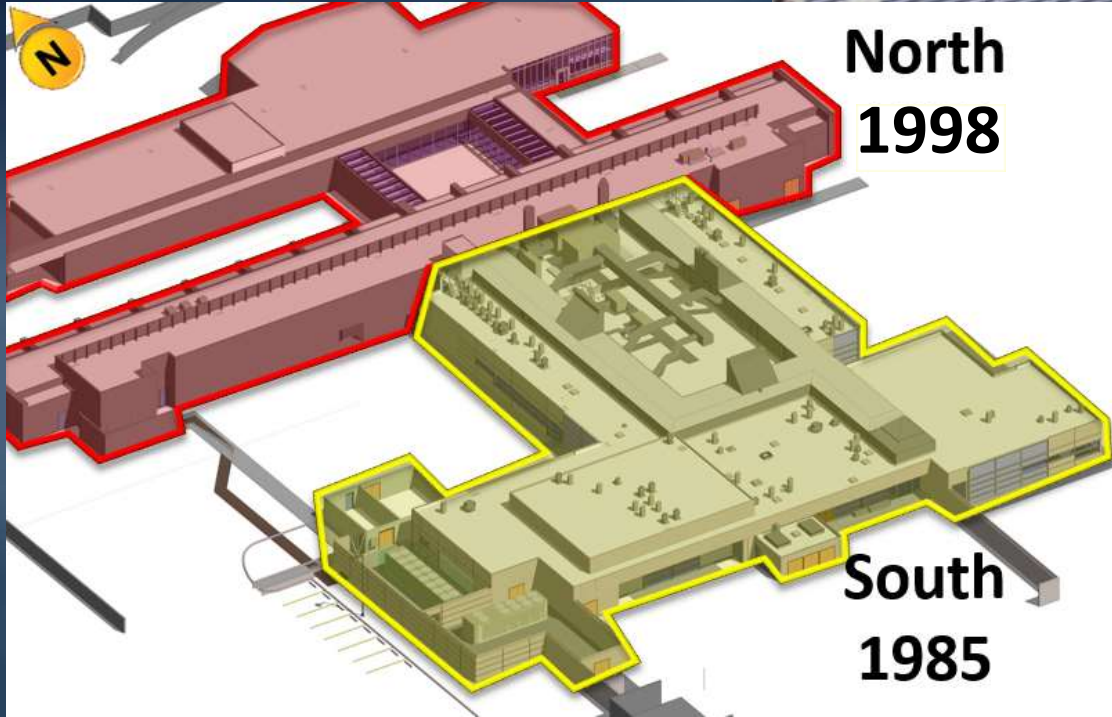


Laboratory No Longer Meets Requirements

- Laboratory requirements
 - Maintain regulatory compliance
 - Emerging issues and contaminants
- Need dedicated spaces and equipment for reuse, PFAS, and microplastics, etc.
 - Clean rooms, pathogen containment, specialized instruments
- Workflow improvements within the building
 - Redesign lab spaces to accommodate expanded functions
 - Need better separation between lab and office areas
 - Improved records and document storage
- Metropolitan needs a state-of-the-art facility that meets all current and future requirements

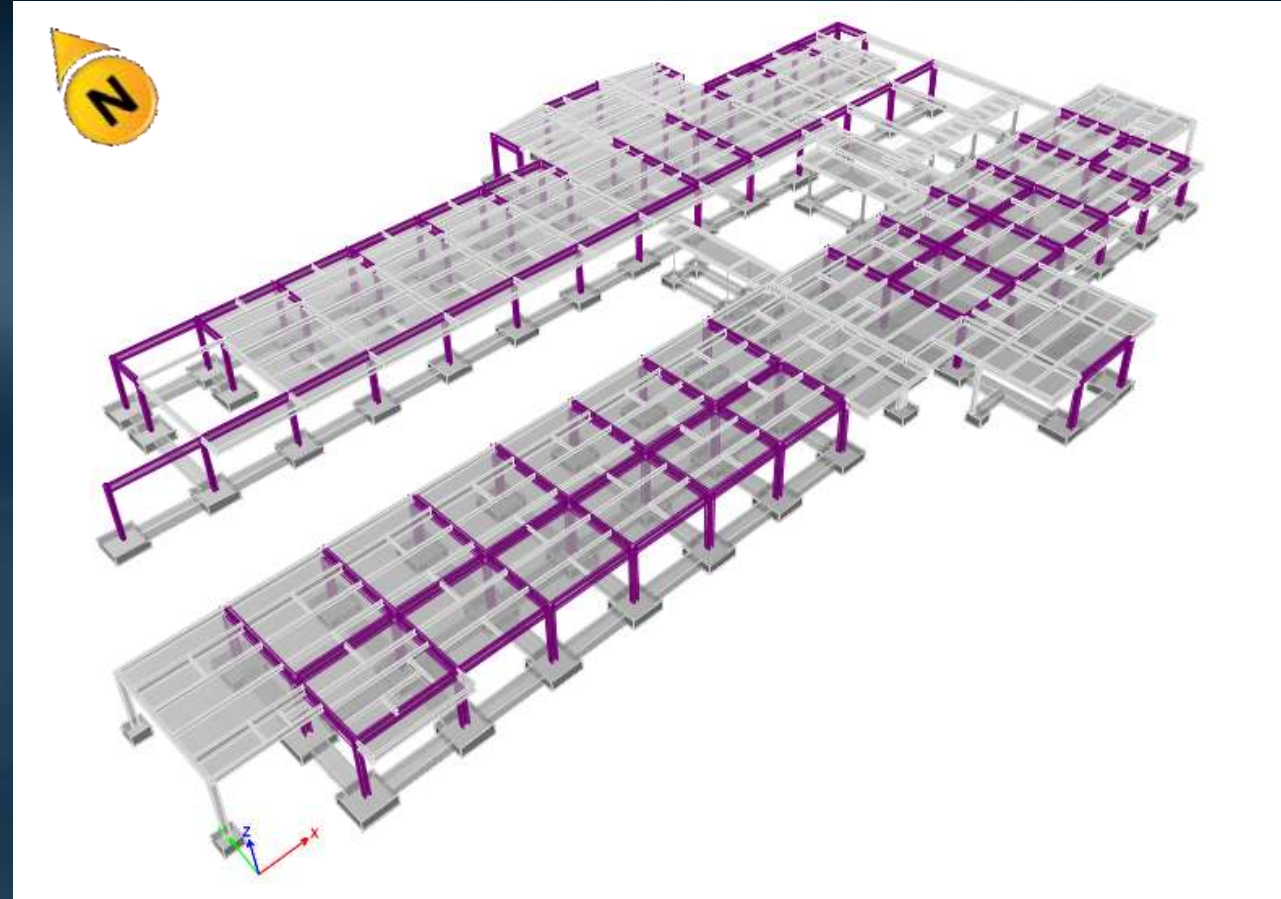


Seismic Resiliency for an Essential Facility

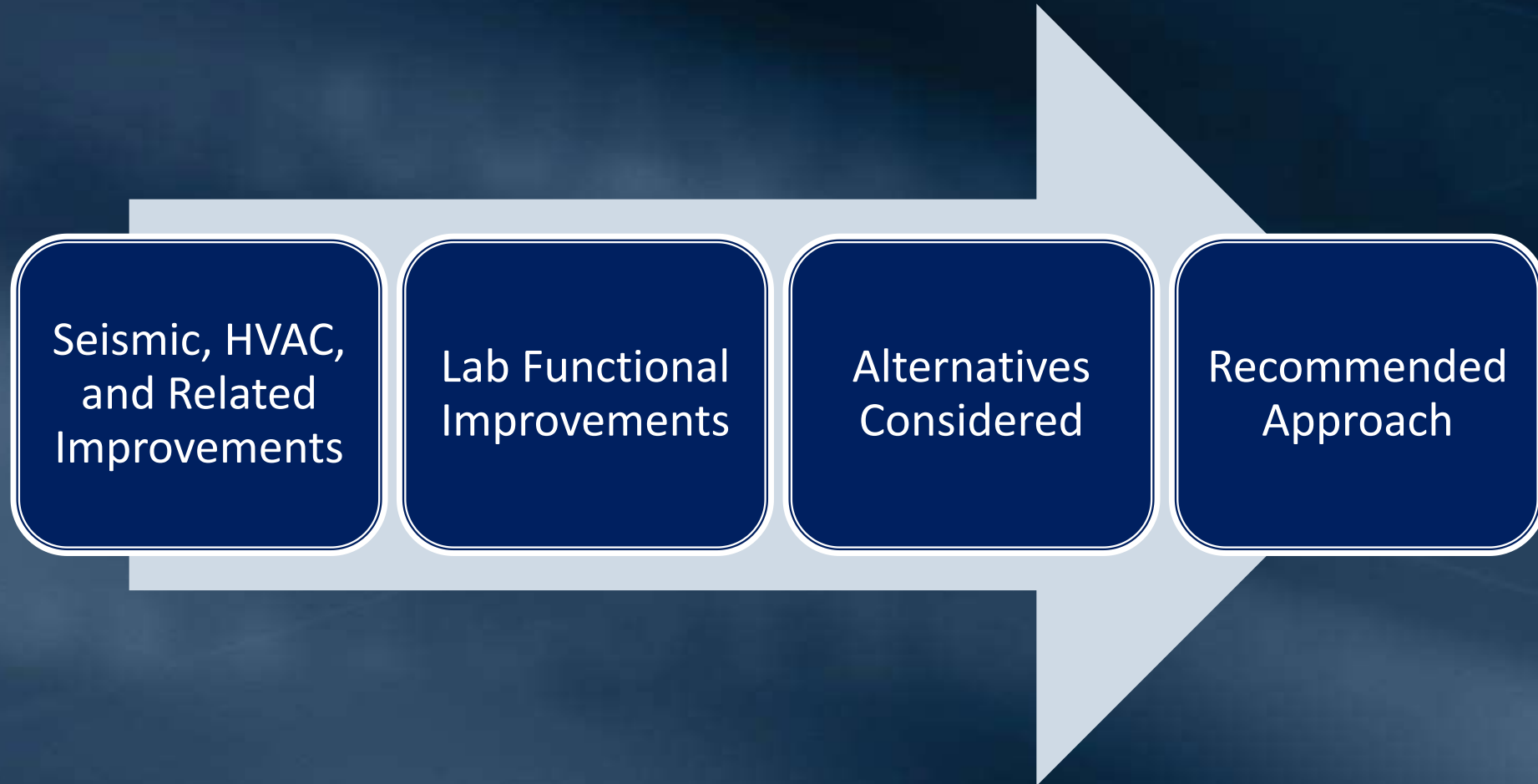


Seismic Resiliency for an Essential Facility

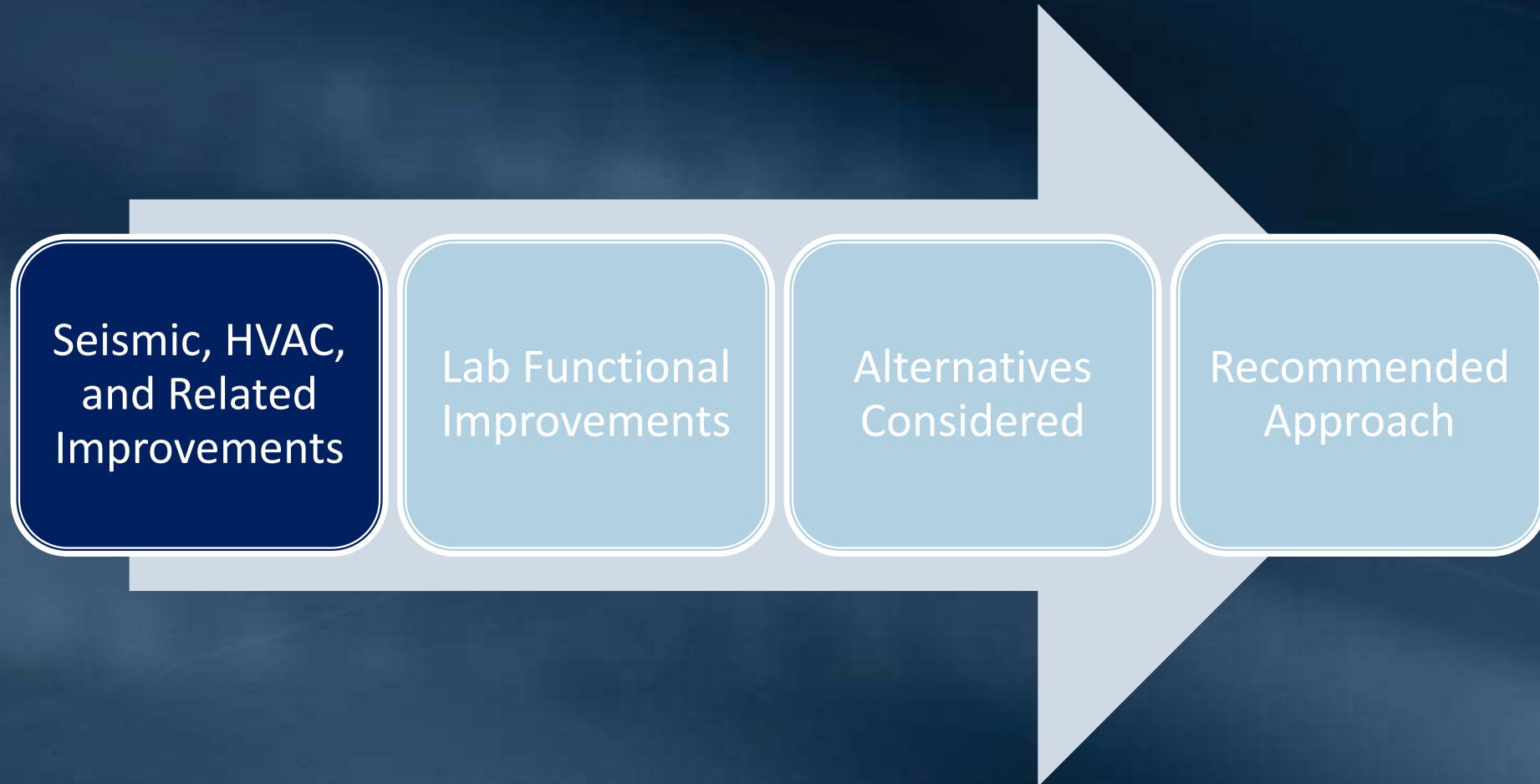
- Building Structure
 - North and south wings are deficient with respect to “essential facility” seismic design criteria
- Building Systems
 - HVAC, fire system, and mechanical, electrical, and plumbing systems require updates



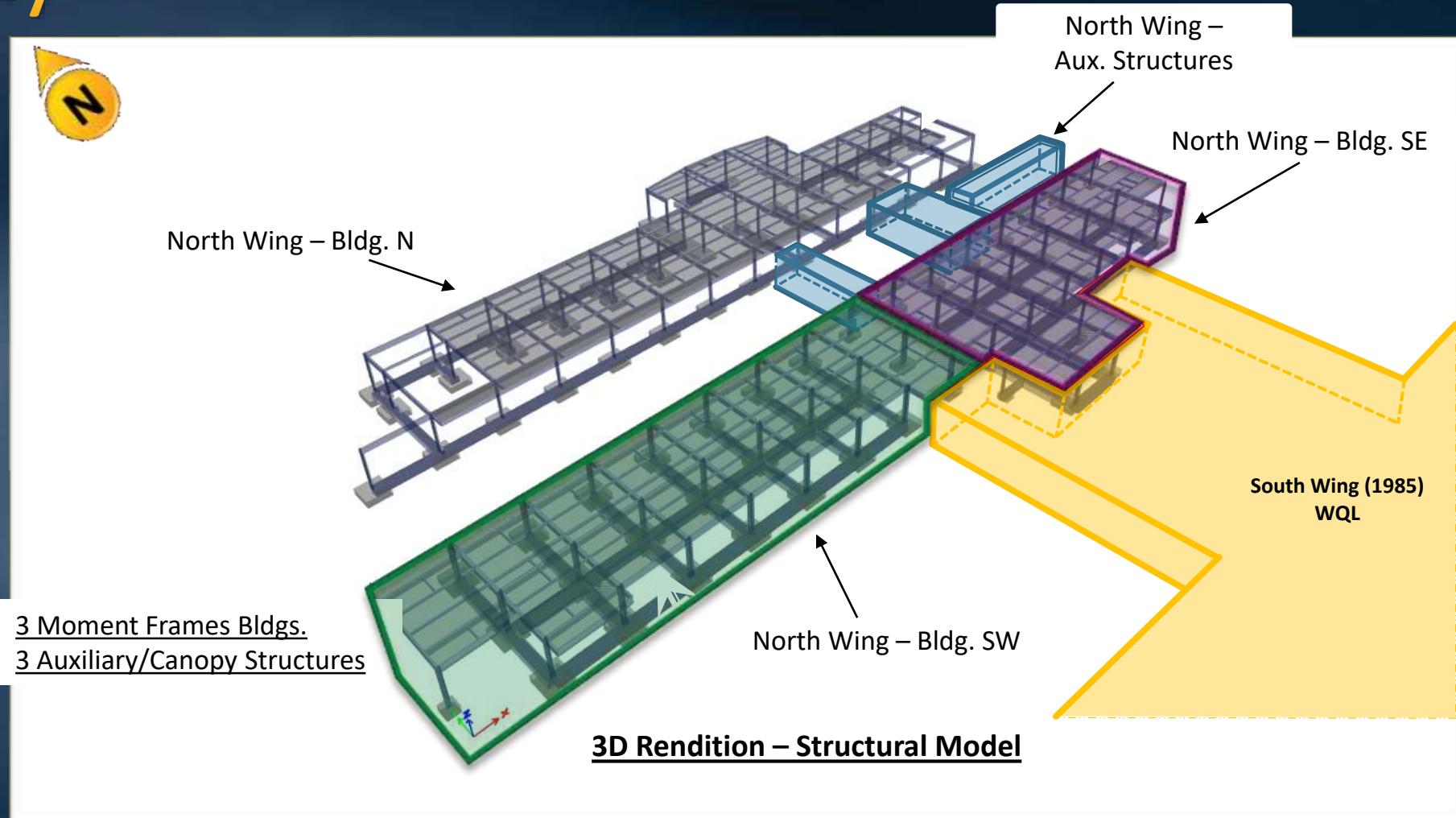
Approach to Planning the WQ Lab Upgrades



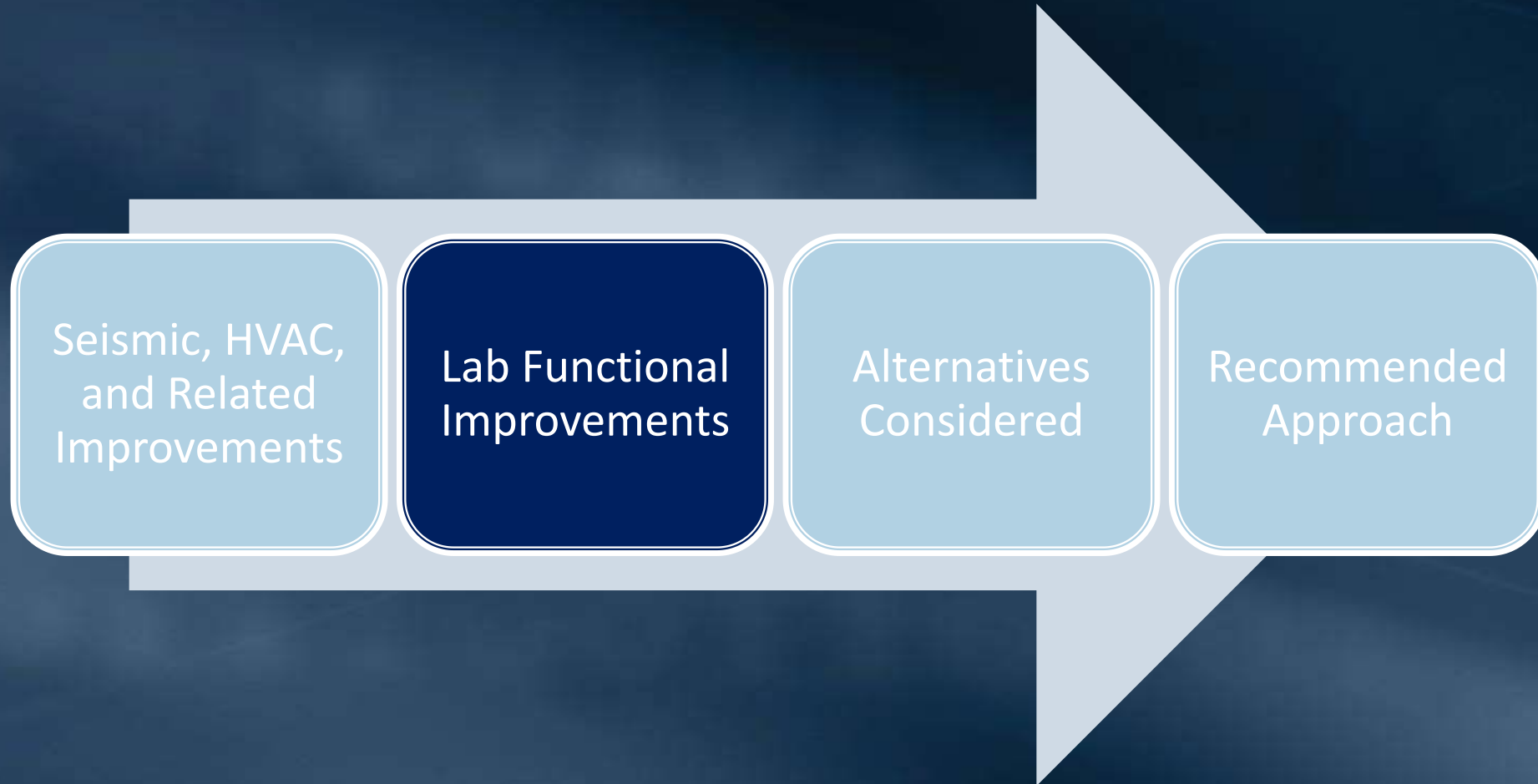
Approach to Planning the WQ Lab Upgrades



Structural Modifications to Achieve Essential Facility



Approach to Planning the WQ Lab Upgrades



Space Planning Study

- Study Execution

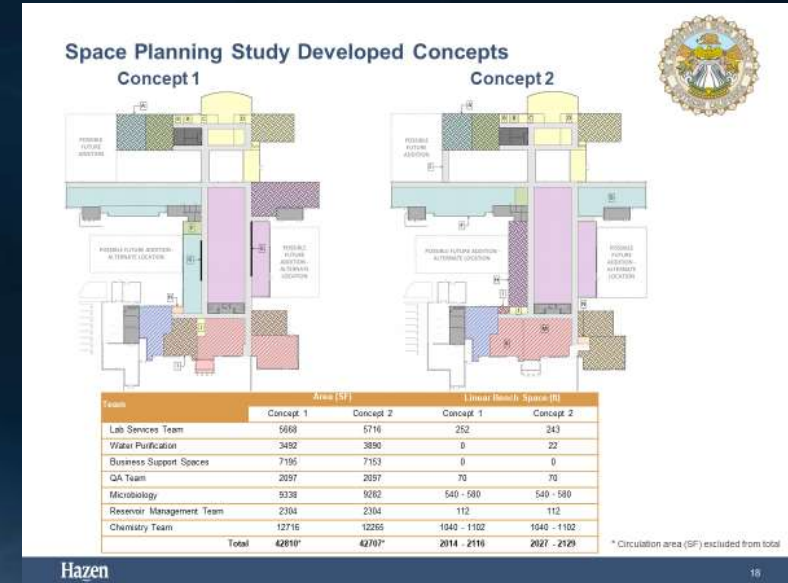
- 9 months, 23 workshops, 4 detailed concepts
 - 3 retrofit alternatives
 - 1 new facility alternative

- Multi-disciplinary team of experts

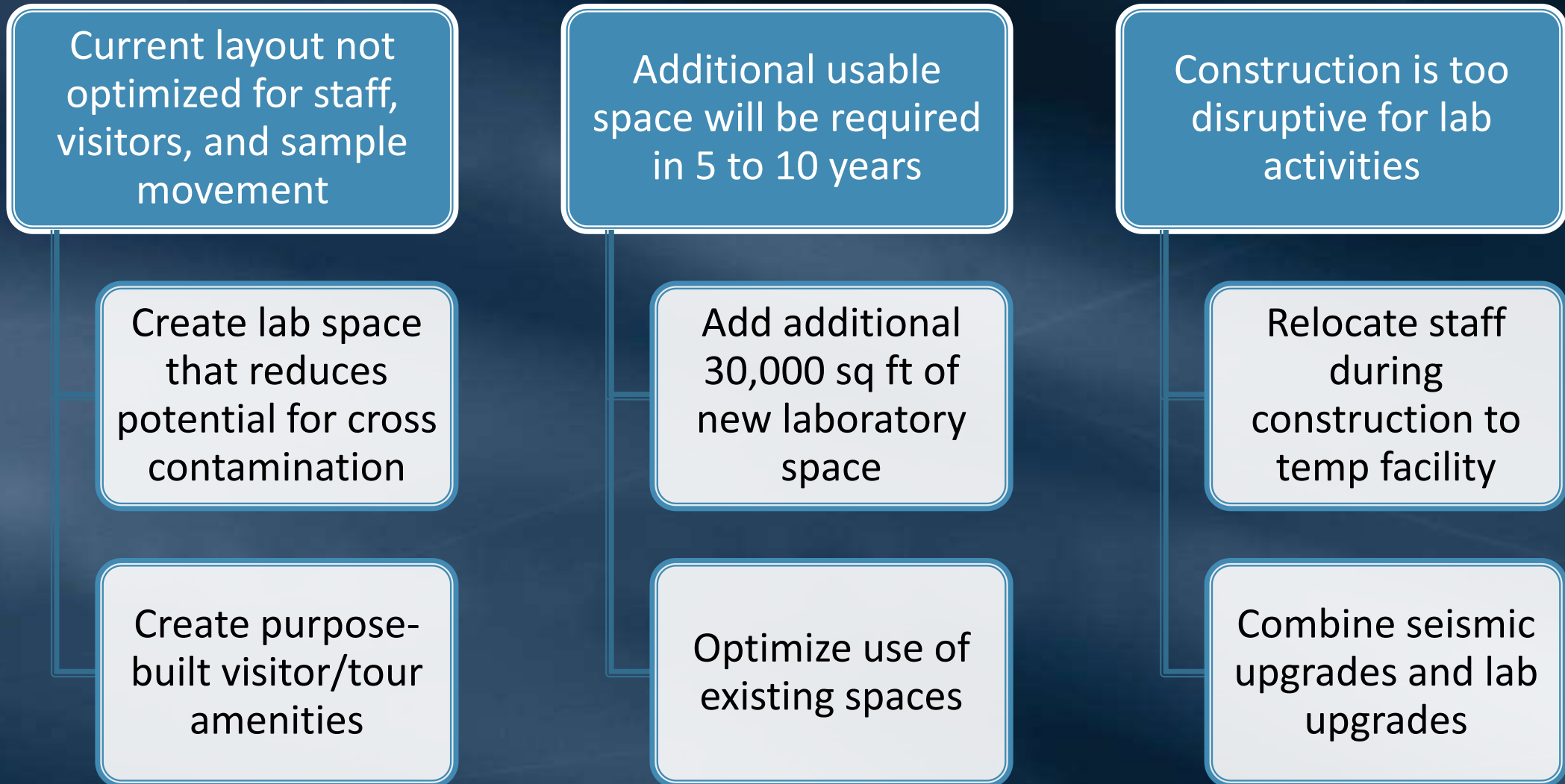
- Metropolitan engineering and water quality staff combined with specialty lab consulting support

- Study Goals and Objectives

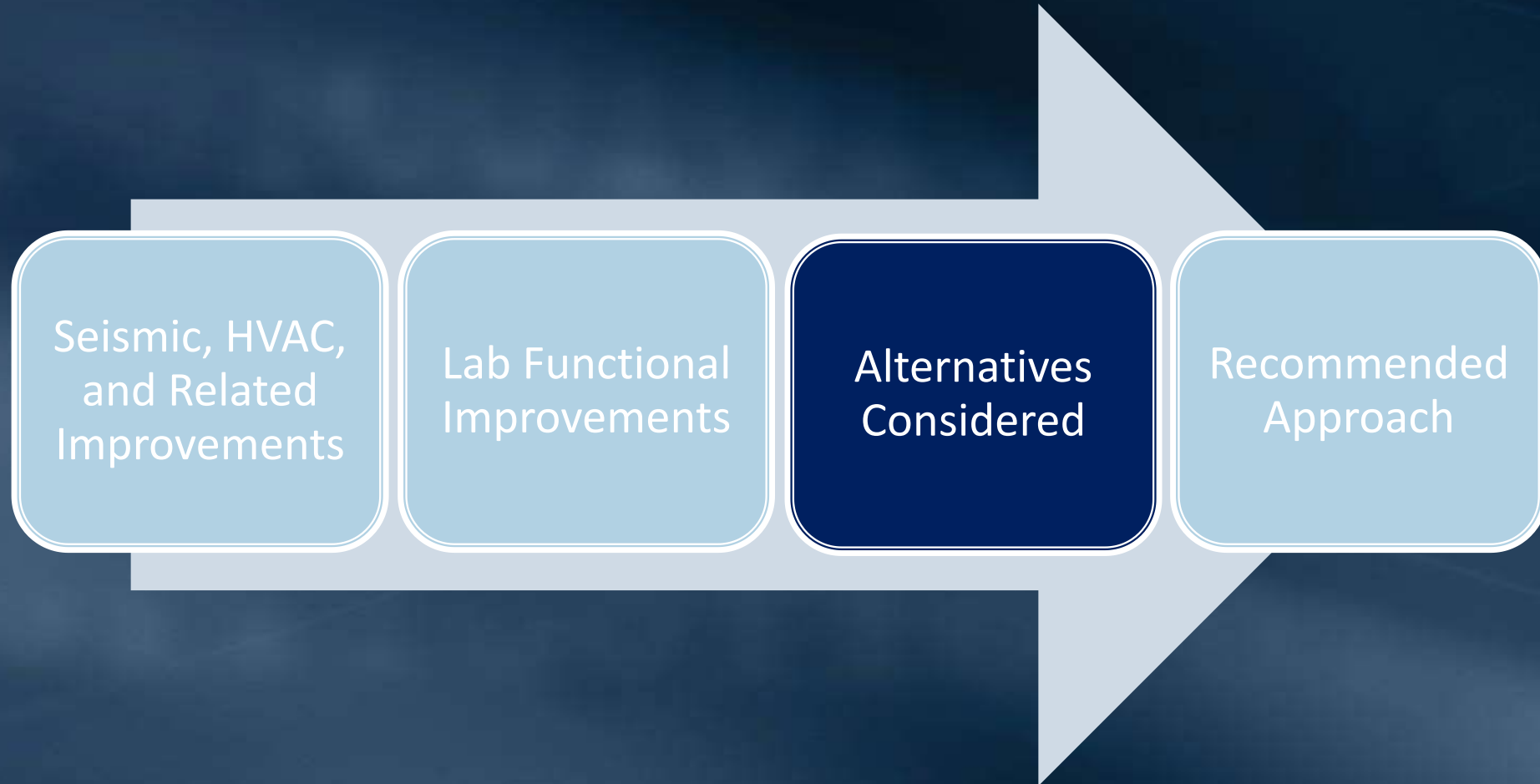
- Provide Metropolitan with a path forward to address critical needs
 - Seismic resiliency
 - Water quality analyses and research
 - Support operations to optimize water treatment
 - Continue leading the industry on emerging water quality issues



Space Planning Study Conclusions and Recommendations



Approach to Planning the WQ Lab Upgrades



Alternatives Considered

- Retrofit and expansion of existing building
 - Cost-effective alternative
 - Involves relocation of staff during construction
- New building
 - More expensive than retrofit/expansion option
 - Utilizes extensive vacant property at La Verne site

Both alternatives result in a seismically resilient, state-of-the-art laboratory prepared for future needs

Retrofit versus New Building – Space Considerations



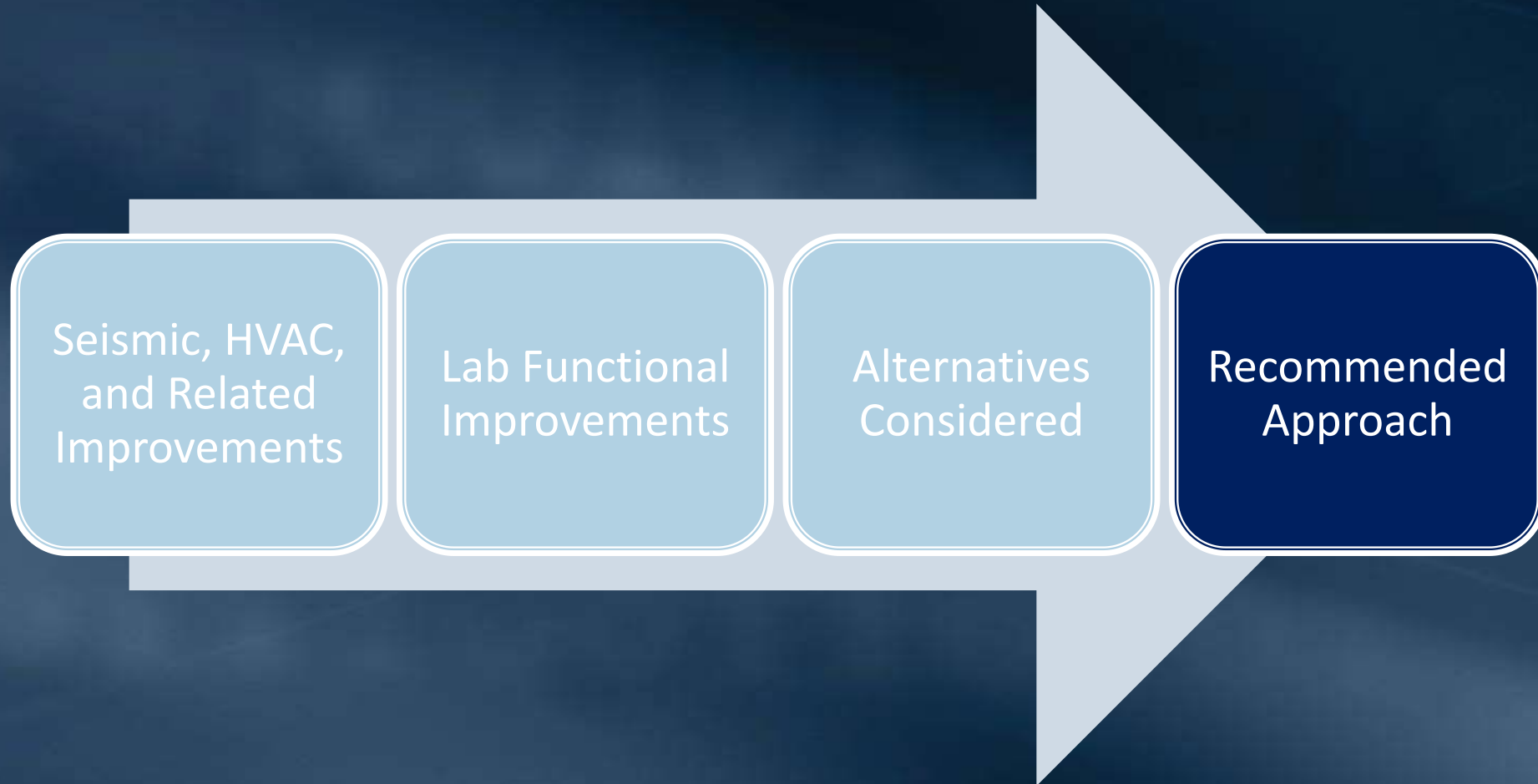
- Existing Lab location
 - Maximizes use of existing footprint
 - Uses existing utility connections
 - Can be isolated from plant operations
- New Building
- Space is limited for new improvements
 - Proposed new location may impact plant operations and future needs
 - Supplemental treatment for recycled water
 - New utilities for lab will impact future projects
 - Crossings and interferences

Retrofit versus New Building – Construction Contract

	Retrofit Utilize/expand existing site	New Building Develop new site at La Verne
Building Cost Total Finished sq ft	\$900 / sq ft	\$1,200/ sq ft
Total Finished sq ft	90k	90k
Building Cost	\$81M	\$110M
Temp Facilities	\$5M	\$1M
New Utilities	-	\$8M
Total*	\$86M	\$119M

*Does not include soft costs (i.e., construction management, engineering support, etc.)

Approach to Planning the WQ Lab Upgrades



Recommended Approach – Retrofit Existing Lab

- Build a seismically resilient, state-of-the-art laboratory to meet requirements and challenges for the next 30 years
 - **Retrofit Existing Building**
 - Seismic retrofit to essential facility criteria
 - Functional space improvements and necessary utility upgrades
 - **Add Additional Space to Existing Building**
 - Up to 30,000 sq ft of new lab space
- **New Lab Equipment**
 - Coordinate existing CIP for new lab equipment with overall building construction schedule



Next Steps

- Receive committee feedback on proposed improvements to Water Quality Lab
- February 2022 Board Action
 - Authorization of new consulting agreements to support planning/design effort for retrofit/expansion of Water Quality Lab
 - Technical Design Services
 - Environmental Planning Support

