

Insular ABCs Comprehensive Final Report



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**US Army Corps
of Engineers**
Honolulu District



Office of Insular Affairs
US Department of Interior



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Preface

The multi-year Insular ABCs Initiative made great strides toward OIA's twin goals of reducing deferred maintenance backlogs and improving organizational sustainability. The school condition assessments, associated deferred maintenance prioritization and programming efforts, facility inventories, launch of the Enterprise Asset Management System, and investment of \$17M into high priority health and safety deferred maintenance backlogs were unprecedented and leave the territories well placed for success. The recently completed Facility Master Plans for Guam and American Samoa provide a remarkable 10-year blueprint for facility managers.

The current surge in federal funding directed to public schools, while greatly needed, masks the underlying problem of chronic underinvestment in public facilities that can only be overcome through dedicated and adequate funding. There is much more to be done including working with local leaders to secure dedicated maintenance funding, strategic investments in workforce training, continuing EAMS support, and other initiatives identified in the report.

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Acronyms and Abbreviations

\$M	Million dollars	ESPC	Energy Savings Performance Contract
AA	Administrative Assistant	FCI	Facility condition index
ABCs	Insular All Buildings and Classrooms	FDM	Facilities Development and Management office
ARP	American Rescue Plan	FMP	Facility Master Plan
ASDOE	American Samoa Department of Education	GDOE	Guam Department of Education
ASG	American Samoa Government	H/S	Health and Safety (deferred maintenance)

Acronyms and Abbreviations (continued)

ATP	Authorization to Proceed	IFBs	Invitations for Bids
BMS	Building Maintenance Superintendent	NEPA	National Environmental Policy Act
CARES	Coronavirus Aid Relief, and Economic Security	O&M	Operations and Maintenance
CIP	Capital Improvement Program	OIA	Office of Insular Affairs (Department of the Interior)
CNMI	Commonwealth of the Northern Mariana Islands	OSP	Organizational Sustainability Plans
CRV	Current Replacement Value	PM	Program Manager
CS	Construction Specialist	POH	Honolulu District (US Army Corp of Engineers)
DM	Deferred maintenance	PSS	CNMI Public School System
DPW	Department of Public Works	RECs	Records of Environmental Consideration
DST	Decision Support Tool	SF	Square foot
EAMS	Enterprise Asset Management System	USACE	US Army Corp of Engineers
EC	EAMS Coordinator	USVI	US Virgin Islands
ECM	Energy Conservation Measure	VIDE	USVI Department of Education



Executive Summary

The Insular All Buildings and Classrooms (ABCs) Initiative encompassed a twelve-year effort by the Department of the Interior, Office of Insular Affairs (OIA) to improve the quality of public schools in the four US territories: American Samoa, the Commonwealth of the Northern Mariana Islands (CNMI), Guam, and the US Virgin Islands (USVI). OIA envisioned a two-pronged strategy covering reducing the deferred maintenance (DM) backlog and building organizational sustainability.

Critical to the success of the ABCs Initiative were the close professional working relationships that local ABCs staff developed with the host agency (HA¹) organizations they were embedded with, as well as outside agencies that supported the procurement, permitting and construction process. The support of agency leadership and facility managers enabled progress with capacity building and DM reduction efforts. Although there was some turnover with HA and embedded ABCs support staff, the Project Managers remained in their positions through the duration of Phase 3 which provided long term stability. The potential for local ABCs staff to transfer to HA staff came close but was not achieved for several reasons, including significant pay differentials.

Early campaigns to establish inter-agency partnerships around the broader public interest in well-functioning school campuses showed promise but generally lacked sustained local leadership support (e.g., homeland defense requirements for civilian shelters, USDA nutrition programs for school aged children, recruiting agency partners to expand the EAMS user base, and fostering workforce training partnerships). The Governors needed to be more engaged to make this initiative successful.

One observation at the outset was that the HAs have no dedicated maintenance funding or empirical data on what a sufficient funding level is and that establishing committed funding needed to be one of the many Phase 3 objectives. Typically, maintenance budgets were increased or decreased from the prior year budget based on other government priorities, leaving the HAs with chronic underfunding and uncertainty. While the Preventative Maintenance Plans and decision support tools have identified what appropriate, steady state funding should be, little to no progress was made in establishing permanent maintenance funding commitments for several reasons including pandemic and natural disaster related distractions, a feeling that the HAs were already consuming the lion share of territorial budgets, lack of sustained HA leadership support, and a general lack of political will.

Years 4 and 5 coincided with the worldwide COVID-19 outbreak that affected work in each of the territories. Host agencies were severely strained to address health and safety needs of students and staff, shifting between in-person and on-line learning, and managing a deluge of federal covid relief funds. Despite these challenges, they continued to strongly support the local ABCs teams and the overall program.

¹ The term “host agency” was used to more simply capture the primary territorial agencies involved in the ABCs initiative because of the varying designations, e.g., Public School System, Department of Public Works School Maintenance Division, and Departments of Education.

Deferred Maintenance Reduction

The DM reduction process involved creating an initial facilities inventory, condition assessments and project prioritization, and assisting the school agencies to implement improvements. One-million dollars (\$M) per year was set-aside in each territory by the respective Governors for five years from OIA’s annual CIP grant funding via separate Memoranda of Agreement executed between 2014 and 2015. A total of \$17M was invested in DM reduction (2022 dollars) to over 1,000 school buildings at 94 schools (85 percent) over a five-year period. The funds were used to address the highest priority DM issues that were identified in the 2013 condition assessments (Phase 2 of the ABCs Initiative). Highest priority DM was typically associated with health and safety (H/S). USACE retained HHF Planners as the prime consultant to manage the project, with funds provided by OIA. Guam and USVI Governors were able to allocate more than \$5M over the five-year period (although some of the additional USVI funds were redirected later), while American Samoa and CNMI Governors redirected some of the dedicated funds to address other priorities. A summary of overall DM and H/S DM identified in 2013 (current dollars) and updated DM totals is provided in Table 1.

Table 1 – Comparison of estimated 2013 DM, 2013 H/S DM, 2021 DM, and 2021 H/S DM (current dollars)

Territory	2013 DM	2013 H/S DM	\$M Invested	2021 DM	2021 H/S DM
AS	\$12.0	\$1.4	\$3.4	\$5.9	\$0.1
CNMI*	\$13.5	\$1.3	\$2.4	\$15*	NA
Guam	\$107.4	\$5.3	\$6.0	\$107	\$70.0
USVI	\$79.1	\$8.7	\$5.2	\$52	\$1.0
Total DM**	\$198.5			\$164.9	

* CNMI stepped away from the ABCs Initiative in 2019 due to Typhoon Yutu recovery efforts, building inventory changes and current DM totals haven’t been updated since late-2018; current DM is an estimate based on last available information (2018) escalated to current dollars

** Total excludes CNMI because information has not been updated since late-2018.

There was an overall reduction in DM of about 17 percent between 2013 and 2021, in part due to DMRP investments but also local host agency investments. H/S DM declined significantly for American Samoa and USVI schools, attributable to the closure and demolition of older buildings that were in poor condition (and those impacted by the 2017 hurricanes in USVI), in addition to DMRP and other local funding sources. Guam’s H/S DM total rose significantly, attributable to the 2013 assessments being conducted while American Recovery and Reinvestment Act projects were ongoing and changes in the prioritization method used in the 2021 assessments (e.g., risk of accelerated deterioration that could lead to loss in structural capacity was accounted for as H/S in the 2021

Overall DM reduction of about 17% (2022 dollars) between the two condition assessments (2013 and 2021) (despite increases due to natural aging)

assessment). USVI opted to forego the 2021 condition assessment because of the multiple facility inspections conducted as part of FEMA recovery efforts related to the 2017 hurricanes.

Organizational Sustainability

In addition to reducing DM backlog, the ABCs Initiative sought to help build organizational sustainability within the facility management offices through various efforts. The assistance that the local ABCs staff provided with project delivery (e.g., scoping, procurement, contracting, closeout) and construction oversight was critical to the execution of DMRP work. The local ABCs staff members' construction experience and the information sharing that they facilitated between territories, as well as input from the Honolulu-based engineering team, helped to create templates for scopes and specifications for projects, materials, and equipment. These templates will continue to serve host agency facility managers into the future.

Organizational Sustainability Plans (OSP) were prepared for each territory with the support of host agencies for each territory in 2017. The prioritized implementation component of each plan guided process improvement initiatives each year thereafter with a focus on topical areas that would be most beneficial to each territory to realize economies of scale. Grounds maintenance primers and preventive maintenance plans helped host-agency facility managers create scopes for contracted work (successful in American Samoa for AC maintenance, Guam and CNMI for grounds, and USVI for several tasks). Maintenance training initiatives (a strong OSP recommendation) varied across the territories and host agencies continue looking for opportunities to advance the capabilities of their staff.

Facility Master Plans

Recommended as a key organizational sustainability measure, the culmination of ABCs efforts is captured in the Facility Master Plans (FMP) that were created in collaboration with the American Samoa and Guam Departments of Education (ASDOE and GDOE); USVI Department of Education (VIDE) had an FMP underway so chose not to join the ABCs FMP initiative. CNMI expressed interest in updating its capital improvement plan but left the program before the FMP initiative was funded (largely due to its focus on Typhoon Soudelor recovery efforts). These facility plans, and the related collaborative planning processes, establish an objective and transparent framework for school improvements over the next ten years. The FMPs focused on the investments needed to address immediate H/S issues (e.g., structural and electrical concerns), recommended investments to transition schools to 21st learning centers (e.g., support student centered learning initiatives with an emphasis on critical thinking, science, technology, engineering, arts and math), and addressing important school construction and consolidation challenges over the coming decade (e.g., to relieve overcrowding or address under capacity conditions).

The transition of the Enterprise Asset Management System (EAMS) instances to host-agency use and management was widely received as an opportunity to streamline facility management practices and document storage and improve capabilities in reporting resource needs. Successes and challenges related to organizational sustainability efforts and lessons learned throughout the ABCs Initiative are discussed further in Sections 5 and 6.

Lessons Learned

Efforts made in executing DM reduction projects and building organizational sustainability were met with different levels of engagement and interest from the host agencies that changed from administration to administration. Several important lessons included:

1. The importance of having local ABCs staff given the many challenges that host-agency personnel face and the many ways in which funding deficits affect the facility management function.
2. The time that HA staff can spare for process improvement is severely limited, further hindering progress in this sector and underscoring the need for continued assistance.
3. Since inception, ways to maximize investments and resource utilization have been explored and cyclical challenges have been observed pointing to the need to change approaches to facility management (e.g., contracting preventive maintenance services instead of investing in untrained maintenance staff).
4. Section 6 addresses lessons learned and thoughts on how the host agencies and OIA can move forward in several areas including continued outside personnel assistance (e.g., ABCs team contributions), building partnerships with related agencies or organizations, local procurement, training, managing impacts of force majeure events, and resolving root causes of DM and facility management challenges.

1 INTRODUCTION

The US Office of Insular Affairs’s (OIA) Insular ABCs Initiative originated with the US Department of Interior’s 2011-2016 strategic plan. One metric under the goal to Improve Quality of Life in the insular areas in the strategic plan was the percent of schools in acceptable condition, focusing on public schools in American Samoa, Guam, and the USVI. Three distinct phases of work were conducted to establish appropriate metrics for “acceptable condition,” determine baseline conditions and then implement a multiyear program, working closely with the various school district managers, to improve school facility conditions and support capacity building measures to ensure long term results (Figure 1). This report documents how the program achieved its goal of improving school conditions and building local capacity to manage school facilities.

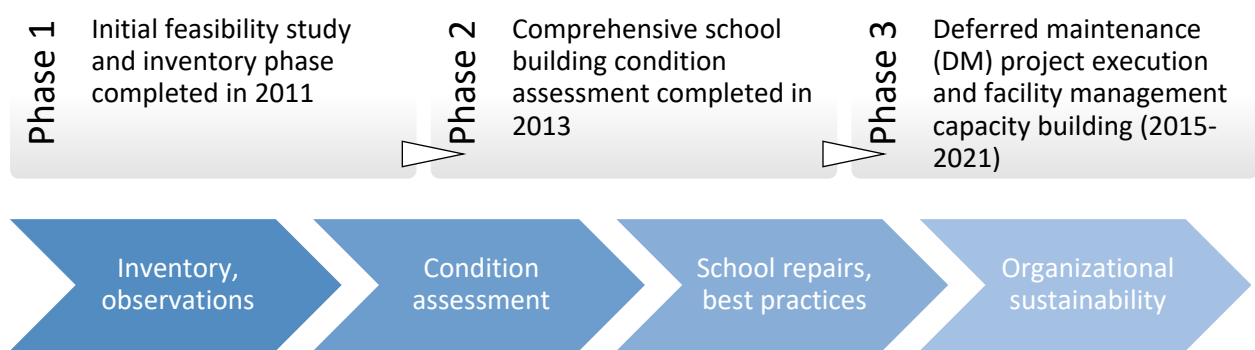


Figure 1 – Steps taken in the three phases of the ABCs Initiative



Figure 2 – Phase 1 report

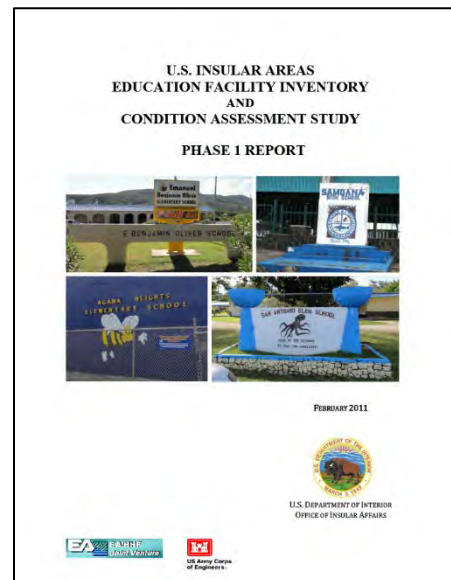


Figure 3 – Phase 2 report

This report provides a brief overview of the three phases of the ABCs Initiative and summarizes the actions undertaken in Phase 3. Sections of the report are arranged by overarching theme as follows:

1. Introduction: ABCs actions, Phase 3 team, notes on the effects of the Covid-19 pandemic on ABCs tasks
2. DMRP accomplishments and transition to host agencies
3. Summary of current conditions based on the 2021 facility assessments
4. EAMS deployment and adoption by host agencies
5. Update on host agency work associated with organizational sustainability program goals
6. Discussion of lessons learned throughout Phase 3 of the ABCs Initiative
7. Conclusion and thoughts for continuing efforts

1.1 ABCs Initiative Goals and Timeline for Actions Taken

The ABCs Initiative was executed over multiple contract years and included a range of actions focused on the primary goals of reducing the DM backlog and fostering practices and programs to prevent the DM backlog from re-occurring. The general timeline for all phases and actions undertaken are shown in Table 2.

Table 2 – General timeline for all phases and actions undertaken

<i>Timeline</i>	<i>Actions Undertaken</i>
<i>Ph1 2010-11</i>	Feasibility Study and Preliminary Approach
<i>Ph 2 2012-13</i>	Condition assessments and DM backlog determination (cost model creation; site map development for each school, condition database development) Energy audits and energy conservation measure recommendations Indoor Environmental Quality assessment findings reports FIMS interactive database/data analysis tool
<i>Ph 3 Year 1 2015-2016</i>	Host Agency Memoranda of Understanding and Operating Agreements Site visits to update high priority DM issues Cost estimates for needed site improvements Energy Conservation Measure recommendation updates Indoor Environmental Quality Handbook EAM system selection and initiation of EAMS buildout Website for ABCs reports DM Reduction Work Plans Initiated the Organizational Sustainability Plan School Facility Planning Workshops in American Samoa and CNMI Local Program Manager (PM) and Construction Specialist (CS) recruitment
<i>Ph 3 Year 2 2016-2017</i>	NEPA reviews for planned work: Records of Environmental Consideration (RECs) Initiated DMRP projects (Work Plan updates) EAMS Coordinator (EC) recruitment OSPs for each territory Grounds Maintenance Primer

Timeline	Actions Undertaken
Ph 3 Year 3 2017-2018	Facility Planning Primers Preventive Maintenance Program Primers EAMS asset collection/data entry, cross training with host-agency staff Work Plan updates and REC addenda/Emergent Addition documentation September 2017: Cat 5 Hurricanes Irma and Maria; five schools closed; VI begins years of recovery effort October 2018: Cat 5 Typhoon Yutu/CNMI exits ABCs program to focus resources on recovery
Ph 3 Year 4 2019-2020	Host agency engagement for maintenance staff training, EAMS transition, Preventive Maintenance Plans and FMPs
Ph 3 Year 5 2020-2021	For American Samoa, Guam, and USVI: Preventive Maintenance Plans One-line electrical diagrams EAMS training and transfer responsibilities to host agencies Document compilation (Operations and Maintenance (O&M) Manuals) American Samoa and Guam: Condition assessments; grounds improvement plan updates; FMPs Guam: Detailed electrical assessments

Phase 3, the final phase of the ABCs Initiative, concluded with transitioning territory-specific instances of the EAMS program and management of remaining DM repair project to host-agency facility managers. This report summarizes Phase 3 efforts, tasks undertaken in Year 5, and considerations moving forward. Topics covered in this report include:



1.2 ABCs Team

The “ABCs Team” referred to in this report consists of the US Army Corp of Engineers, Honolulu District (POH) Project Management team and the HHF Planners team consisting of Honolulu based planners, architects and engineers and local staff in each of the participating territories.

Table 3 – Insular ABCs Team Members

	Overall Lead	USACE POH
	Consulting Team Leader/Facility Planners	HHF Planners.
	Architect	Mason Architects, Inc.
	Structural Engineer	Martin, Chock & Carden, Inc.
	Mechanical, Electrical, Plumbing, Fire Protection Engineers	InSynergy Engineering, Inc.
	Civil Engineers	Okahara & Associates, Inc. and Austin Tsutsumi & Associates

EAMS Developer	Clango, Inc.
American Samoa PM	Monty Chin
American Samoa CS	Epenesa Jennings
American Samoa EC	Nelda Emory
CNMI PM	Rod Brickey
Guam PM	Sabino Flores
Guam CS	Henry Villanueva
Guam EC	Jack Hattig
USVI PM	Brian Turnbull
USVI CS	Vancito Gumbs/Lionel Jacobs/John Bedminster
USVI EC	Sean Francis
USVI Administrative Assistant (AA)	Nichole Charles

1.3 The Covid 19 Pandemic

The rise of Covid-19 in early 2020 and the global pandemic that ensued, disrupted ABCs Year 4 efforts, with school closures and work-from-home requirements and continues to present challenges through Year 5. Host-agency briefings were all held online, and the Honolulu-based team members were not able to conduct over-the-shoulder reviews, site visits, and data gathering as planning and as has been conducted in other years. Related travel restrictions had the largest impact in American Samoa, preventing the local ABCs PM from returning for a year and a half after a routine medical procedure in Honolulu and blocked the engineering team from participating in condition assessments, which were by the local PM and ASDOE maintenance staff. EAMS transfer to host agencies was also delayed as host agencies were responding to emergent needs to close schools, modify facilities, and then reopen schools to students (in addition to regular day to day responsibilities). These delays and travel restrictions limited possibilities for in-person EAMS training. Video-teleconferencing enabled the team to successfully work through the challenges and complete the Phase 3 ABCs tasks.

1.4 Memorandum of Understanding

Memoranda of Understanding (MOU) between each territorial Governor and OIA were executed as a precursor to Phase 3 to demonstrate a mutual commitment to provide functional and safe schools to create the best possible learning environment for school children. The MOUs affirmed the Governors’ desire to continue the Insular ABCs initiative, working collaboratively, to assess and improve K-12 public school facilities. Through the MOU, both parties agreed to cooperate on Phase 3 of the Insular ABCs initiative, which included technical support from OIA (i.e., the ABCs Team), with the understanding that the Governor set aside a minimum of \$1 million of OIA’s annual CIP grant funding for the DMRP, for a period of five years. The Governors were also encouraged to set aside additional local funds to support the initiative (the USVI Governor set aside an additional \$2 million). The MOU also established the key points of contact, composition of the ABCs Team, accountability, funding arrangements, and roles in support of the program.

MOUs were signed by the Governor of each territory on:

- American Samoa: November 14, 2014
- CNMI: June 17, 2014
- Guam: April 1, 2015
- USVI: September 22, 2014

2 DMRP Accomplishments

Each of the four territories received different funding allotments because of decisions made by local governments. Governors initially agreed to set aside \$1M per year for five years, but American Samoa and CNMI later reallocated DMRP funds for other uses; Guam and USVI were able to set aside additional funds for DMRP use. A total of \$17M was invested in DM reduction to over 1,000 school buildings at 94 schools (85 percent) over a five-year period (2022 dollars). Guam and USVI Governors contributed more than the agreed upon \$1M per year, \$2M extra for Guam and an additional \$1.2M for USVI. American Samoa and CNM governors were unable to allocate additional funding for DMRP work. All available funds were expended in American Samoa and CNMI, while responsibility for DMRP project oversight transferred to the host agencies for remaining funds in Guam and USVI due to procurement delays. Funding allotments, expenditures, and funds transferred to host agency oversight are shown in Figure 4. Procurement delay issues are discussed further in Section 6.4.

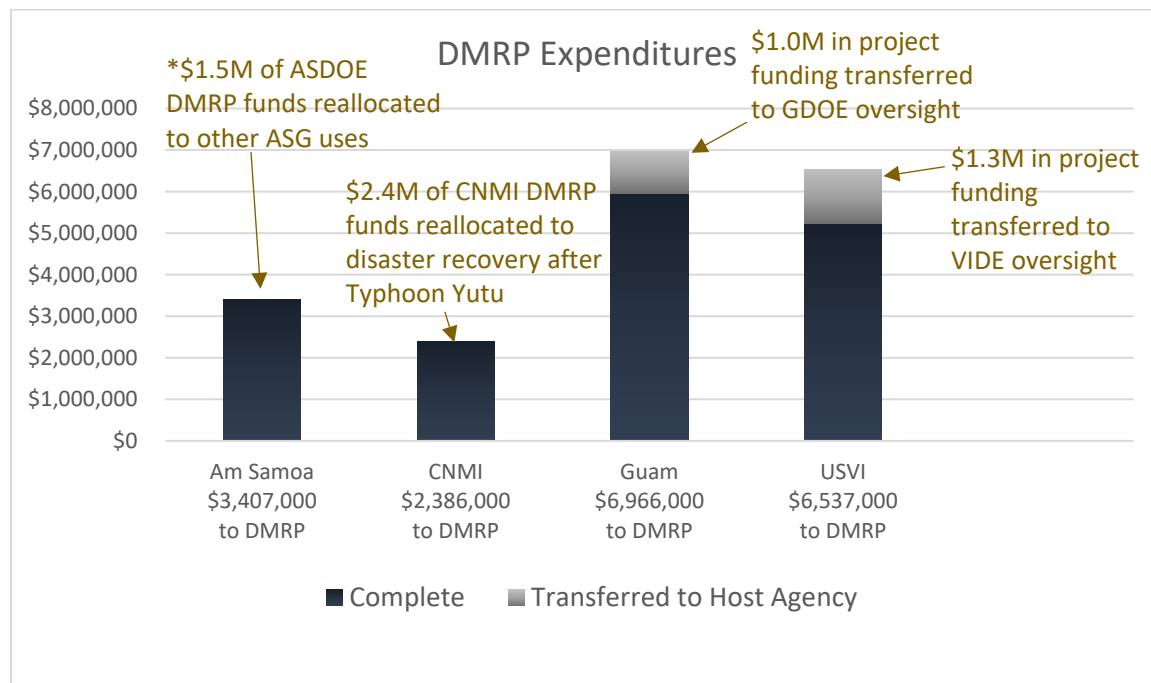


Figure 4 – Funding allotments, expenditures, and funds transferred to host agency oversight

DMRP dollars invested in the repair of public schools, current DM totals, territory facility condition index (FCI; the ratio of DM to replacement value), and the number of schools and buildings improved by territory is shown in Table 4 (all costs in 2022 dollars).

Table 4 – Funds invested, number of schools and buildings improved and current conditions summary by territory (\$M; 2022 dollars)

Territory	\$ Invested	Schools Improved	Buildings Improved	Current Replacement Value (CRV)	Current DM	2013 FCI	2021 FCI
AS	\$3.4	24	215	\$79M	\$5.9M	10%	7%
CNMI*	\$2.4	20	145	\$174M	\$15M	7%	9%
Guam	\$6.0	34	644	\$823M	\$97M	10%	12%
USVI	\$5.2	16	32	\$394M	\$52M	11%	13%

* Estimate for CNMI is based on last available information (2018) escalated to current dollars

Table 4 shows that FCI increased in all territories except for American Samoa (CNMI’s FCI is estimated based on last known conditions in 2018, before CNMI left the ABCs Initiative). This exemplifies the challenges of addressing DM with inadequate maintenance budgets. American Samoa’s ability to reduce FCI is in part related to the extensive program of demolishing older more deteriorated facilities and the construction of new facilities (new facilities have an FCI of zero) (with local funds- not from the ABCs program). Current conditions and investment needs of the school districts are described further in Section 3.

To show the changes in DM between the 2013 and 2021 assessments in current dollars, Table 5 includes a summary of DM identified in 2013 (escalated to 2022 dollars) and how much of that was H/S DM, the funding used for DM reduction, the number of buildings demolished between 2013 and 2021, updated 2021 DM totals, and 2021 H/S DM for each of the territories.

American Samoa and USVI DM decreased significantly (aided by building demolition); Guam DM appears unchanged (larger investment required)

Table 5 – Comparison of estimated 2013 and 2021 DM and FCI, Funds invested, and number of school buildings demolished (\$M; 2022 dollars)

Territory	2013 DM*	2013 H/S DM*	\$M Invested	Buildings Decommissioned	2021 DM	2021 H/S DM
AS	\$12.0	\$1.4	\$3.4	36	\$5.9	\$0.1
CNMI**	\$13.5	\$1.3	\$2.4	Unknown	\$15	NA
Guam	\$107.4	\$5.3	\$6.0	26	\$107	\$70.0
USVI	\$79.1	\$8.7	\$5.2	101	\$52	\$1.0
Total	\$198.5***	\$16.7	\$17	163	\$164.9***	\$71.1

* Escalated to 2022 dollars

** CNMI left the ABCs Initiative in 2019 due to Super Typhoon Yutu recovery efforts, building inventory changes and current DM totals haven’t been updated since late-2018; current DM is an estimate based on last available information (2018) escalated to current dollars

*** Total excludes CNMI because information has not been updated since late-2018.

There was an overall reduction in DM, beyond the investments made for DMRP work, a decrease of about 17 percent (excluding CNMI because information has not been updated since late-2018). H/S DM reduced significantly for American Samoa and USVI schools, attributable to the closure and demolition of older buildings that were in poor condition (and those impacted by the 2017 hurricanes in USVI) in addition to DMRP efforts. Guam’s H/S DM total rose significantly, and this is attributable to the different prioritization method that was used in the 2021 assessments (see Section 3).

It is worth noting that although Guam and USVI decommissioned many buildings, they still have higher estimated FCIs in 2021 than 2013 (in current dollars) due to underinvestment in the remaining buildings over the eight years since the 2013 facility condition assessments (and prior).

Demolishing old deteriorating buildings and constructing new facilities can be an effective way to reduce DM and modernize learning spaces, however, this approach requires high levels of investment that can be difficult to maintain over time, especially considering that 565 buildings in the EAMS inventory for the four territories are more than 50



Figure 5 – GDOE Superintendent and staff at the first DMRP project

years old (about 40 percent of all buildings).

2.1 Work Plans and Work Plan Updates

DMRP “work plans” were created for each territory at the start of Phase 3 to identify highest priority repairs (typically related to H/S), work that should be conducted in tandem, and associated rough order of magnitude costs. Basic project prioritization, in descending order of importance, focused on:

1. H/S issues that present an immediate or serious potential risk to occupant safety
2. Issues that affect other systems (e.g., building enclosure, site flooding)
3. Remaining H/S issues
4. Subsequent priorities were informed by Phase 2 condition ratings and host agency input.

Phase 2 Condition Rating Definitions

- 5. No DM.** Only normal scheduled maintenance required.
- 4. Minor DM.** Some minor repairs needed. System functions as intended.
- 3. Moderate DM.** More minor and some larger repair required. System occasionally unable to function as intended.
- 2. Significant DM.** Significant repairs required. Excessive damage clearly visible. Obsolete. System not functional as intended. Parts not easily obtainable. Does not meet all codes.
- 1. Major DM.** Major repair/replacement required to restore function. Unsafe to use.
- 0. Not Present.** Element needs to be acquired/installed

Work plans explained the project prioritization methodology and the types of recommended repair and replacement projects. The 2013 assessment data was reviewed and updated through consultation with school district personnel, incorporating reports of work complete, as well as input from site visits to some of the schools by the ABC’s inspection team in Spring 2015.

The ABCs Team vetted prioritization criteria and refined project recommendations with local facility managers. The resulting work plans became the framework for the DMRP. These plans were updated in the first few years of Phase 3 as priorities shifted with emerging issues and as host agencies completed work through other efforts. Timeframes for work plans and updates are shown in Figure 6.

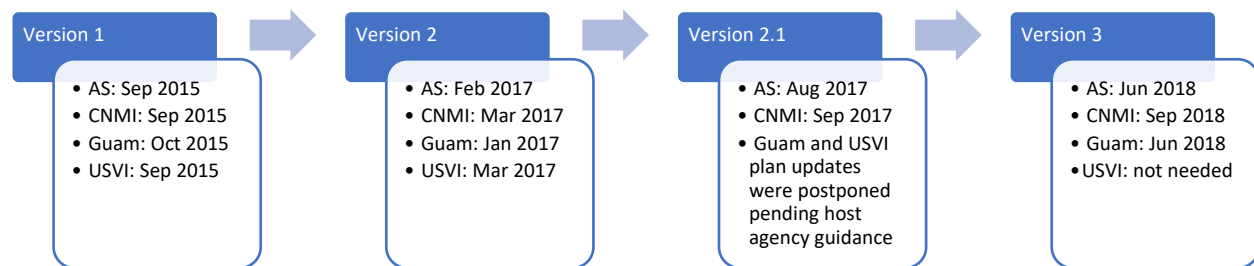


Figure 6 – Timeframes for work plans and updates

Work plan updates after 2018 were coordinated through simpler memos and discussions during monthly calls to ensure concurrence on priorities and avoid duplication of effort. Project sequencing was influenced by required National Environmental Policy Act (NEPA) reviews tied to use of federal funds (see Section 2.2), need for design, ability to conduct the work in house, and procurement approaches for contracted work. Procurement thresholds, generally depicted in Table 6, informed timeframes and approaches.

Table 6 – Government contracting dollar limits and procedures by territory

Territory	Sole Source	In-house Selection (3 bids)	Formal IFB/RFP Process	Other Considerations
AS	< \$2,500	< \$10,000	> \$10,000	Limited contractor capacity for \$1M+ work
CNMI*	< \$10,000	\$10,000-\$30,000	> \$30,000 (requires Board approval)	Limited contractor capacity for \$1M+ work
Guam	Not Applicable	< \$100,000	> \$100,000	\$100K+ requires GDOE legal review; \$500K+ Atty. General approval
USVI	< \$5,000 (three quotes, no purchase order)	< \$50,000	> \$50,000	Limited contractor capacity for \$1M+ work

To provide a frame of reference, a contract under \$2,500 in American Samoa would be sufficient to address smaller projects such as minor electrical panel improvements or replacement of split AC units. In USVI, the “three quotes” category is comparable to work that inhouse maintenance staff could do (e.g., window or door replacement or minor AC repairs).

The high number of procurement documents going through ASDPW, and the AS Office of Procurement was one cause of delay. To address this in American Samoa, the ABCs Program Manager worked with ASDPW and the AS Office of Procurement to raise the limit from \$2,500 to \$10,000 for projects that could be procured with a purchase order instead of using the more time consuming IFB/RFP process that is conducted by the Office of Procurement. This change allowed the DPW/ABCs team to execute more work through DPW’s internal procurement process and reduce the workload that the Office of Procurement was responsible for managing. These provisions have improved the situation, but the limit is still relatively low (e.g., Guam DOE limit was historically \$50,000, and was recently raised to \$100,000). Similarly, VIDE’s inhouse procurement limit is \$50,000 and VIDE would be able to procure a wider range of repair project faster if the inhouse procurement limit was increased to \$100,000. For both territories, the potential to procure more work inhouse would have to be balanced with the respective Department’s ability to manage the additional workload.

Procurement processes in all territories were long and fraught with issues of misplaced procurement documents, staff turnover delays, and a multilayered, oftentimes opaque governmental review process that severely restricted the school district’s ability to execute its projects in a timely manner (see Section 6 for discussion on lessons learned). Extensive regional damage and disruption occasionally caused by hurricanes and typhoons forced the school districts to reprioritize their maintenance programs to disaster recovery and focused negotiations with FEMA for recovery funding.

Getting momentum early in the program required identifying a subset of smaller projects to pursue with in-house staff or smaller contractors while the longer procurement processes were pursued for more complex projects. DM priorities guided the focus of the work plans and procurement considerations informed project packaging.

2.2 NEPA reviews – Record of Environmental Consideration (REC) Process (USACE NEPA procedures)

OIA project funding was predicated on Authorizations to Proceed (ATP) issued by USACE based on a NEPA compliance finding for each project. ATP prerequisites included proposed DM repair work complying with NEPA provisions and listing on an authorized Work Plan (i.e., signed by both the host agency and OIA). Most of the DM projects involved routine repairs (e.g., spall repairs, interior renovations, replacing worn or outdated electrical systems and mechanical equipment) that typically are exempt or classified as categorically excluded from more detailed NEPA analysis such as an Environmental Assessment (EA). The ABCs Team supported USACE NEPA compliance review for all facility repairs identified on the work plans and associated school buildings and campuses through a series of RECs.

NEPA compliance is a complex process requiring awareness of the range of federal and state environmental regulations and procedures associated with project execution. USACE has invested considerable effort on OIA’s behalf to train host agency staff but with staff turnover, it’s an ongoing process. The introduction of a standardized process coupled with general agreements from local regulatory agencies on what constitutes a REC0001 and REC0002 projects discussed herein has created more of a checklist/streamlined approach that host agency staff can use going forward.

RECs were divided into two categories, REC001 and REC0002. REC001 was for buildings that would be under 50 years old at the anticipated time of construction (e.g., not eligible for the National Historic Register of Historic Places) and that did not include ground disturbance to ensure impacts to historic resources would be avoided. REC002 was for proposed work at older buildings and work that included ground disturbance. REC addenda were created when host agencies requested substantial additions to the authorized DMRP Work Plan due to revised priorities (e.g., accelerated deterioration of certain items). In addition to the RECs, several requests to address “Emergent Additions” were submitted to OIA for items that were not explicitly covered in previous RECs but aligned with the findings of previous RECs (e.g., additional items at a building that was previously approved for repairs). Timeframes for RECs and follow-on addenda are shown in Figure 7.

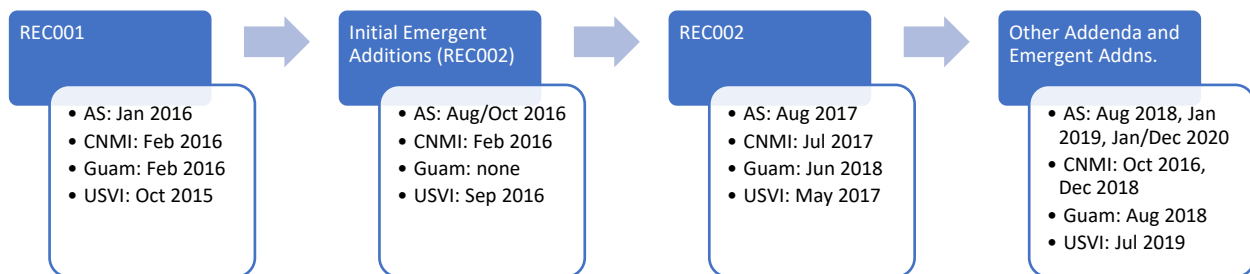


Figure 7 – Timeframes for RECs and REC Addenda

A full list of submitted RECs, addenda, and emergent additions is provided in Table 7. The table demonstrates when documentation was submitted, and when authorization to proceed was received from OIA.

Table 7 – List of REC, addenda, and emergent addition filings for all territories.

Territory	REC	Approval Date	Description	Authorization to Proceed date
American Samoa	001	1/21/2016	V.1. Buildings < 45 yrs. old, and non-intrusive projects.	1/28/2016
American Samoa	001	8/18/2016	Emergent Addition: Matatula Elementary School Roof replacement	8/23/2016
American Samoa	001	9/30/2016	Emergent Addition: Site drainage improvements at 4 schools	10/6/2016

Territory	REC	Approval Date	Description	Authorization to Proceed date
American Samoa	001	8/11/2017	Addendum 1 to REC001 V.1.: additional projects at 21 schools added to work plan.	8/22/2017
American Samoa	001	8/20/2018	Addendum 2 to REC001 V.1.: four additional projects at 2 schools added to work plan.	6/6/2019
American Samoa	001	1/17/2019	Emergent Addition: Railing repair at 1 school.	1/21/2019
American Samoa	002	8/17/2017	V.1. Buildings > 45 yrs. old, and projects requiring ground disturbance.	8/22/2017
American Samoa	002	12/30/2020	Emergent Addition: Roof repair at 1 school.	1/11/2021
CNMI	001	2/12/2016	V.1. Buildings < 45 yrs. old, and non-intrusive projects.	2/24/2016
CNMI	001	11/18/2016	Emergent Addition: plumbing repairs at 1 school. Roof repairs at 2 schools. Air Conditioning repairs at 1 school	1/12/2017
CNMI	002	9/27/2016	Emergent Addition: Plumbing repairs at 4 schools. Electrical repairs at 3 schools.	10/6/2016
CNMI	002	7/6/2017	V.1. Buildings > 45 yrs. old, and projects requiring ground disturbance.	10/5/2017
Guam	001	2/16/2016	V.1. Buildings < 45 yrs. old, and non-intrusive projects.	2/24/2016
Guam	001	8/23/2018	Addendum 1 to REC001 V.1.: additional projects at 23 schools added to work plan.	8/31/2018
Guam	002	6/26/2018	V.1. Buildings > 45 yrs. old, projects requiring ground disturbance, and projects that could impact the Northern Guam Sole Source Aquifer.	7/13/2018
USVI	001	10/28/2015	V.1. Buildings < 45 yrs. old, and non-intrusive projects.	11/2/2015
USVI	001	9/14/2016	Emergent Addition: Roof mounted AC repair at 4 schools	9/27/2016
USVI	002	5/15/2017	V.1. Buildings > 45 yrs. old, and projects requiring ground disturbance.	6/7/2017
USVI	002	7/29/2019	Addendum to REC002 V.1.: additional projects at 3 schools added to work plan	7/31/2019

The REC typology ultimately expedited project reviews and guided investments toward lower risk projects (e.g., avoiding adverse effects to historic properties) and establishing an objective set of standardized BMPs for each project.

2.3 Energy Audits and Energy Conservation Measures

One of the goals in Phase 3 of the ABCs initiative was to build partnership with local and federal agencies that help support public school facilities in the territories and find opportunities to align efforts and resources in the implementation of energy conservation measures (ECMs; see Section 6.3 for discussion of lessons learned in engaging agency partners). An energy audit implementation plan was created for each territory for potential execution in tandem with DMRP work (energy retrofits typically

come with their own funding sources that can often address pre-existing DM issues (power upgrades, roof repairs, lighting retrofits, restroom fixture upgrades, etc.).

As a recap of the Phase 2 energy audit findings, updated in 2015 to account for ECMs that were implemented (e.g., replacing T-12 with T-8 lighting and selective plumbing upgrades to low flow fixtures), Table 8 below provides an overview of the ECMs that were recommended for each insular area, the potential annual savings in utility costs, the estimated amount of time needed to payback ECM investments (simple payback), and the percent of utility cost reduction (based on the 2013 assessment).

Table 8 – Overview of Updated Energy Audit ECM Recommendations (data from the 2015 update, shown in 2015 dollars)

	Am. Samoa	CNMI	Guam	USVI	Totals
ECMs Electric					
New Solar Hot Water or Heat Recovery System					
Replace T12 Fixtures with T8 LED	NA	NA	NA	NA	
Replace T8 Fluorescent Lamps with T8 LED					
Programmable Thermostats for AC					
Roofmount 30-200 KW PV system					
Fix Supply Air Discharge Duct Leaks					
New Lighting Controls					
New VFDs/High Efficiency Booster Pump Motors					
New Heat Recovery/ Desuperheater System					
Insulate Non-insulated Roofs					
Replace AC Systems with High Efficiency Units					
Retrofit with Ultra Low Flow Plumbing Fixtures					
Total Investment (\$M) Primary ECMs	\$9.10	\$11.10	\$14.10	\$35.00	\$69.30
Simple Payback (years) Primary ECMs	8	7	9	8	8
Investment Capitalization (years) - Primary ECMs Based on 3% Interest Rate	10	8	10	10	10
Dollar Savings (millions per year) - Primary ECMs	\$1.08	\$1.50	\$1.64	\$4.18	\$8.40
Percent Reduction in Utility Costs - Primary ECMs	55%	61%	19%	54%	40%
Total Investment (\$M) All Feasible ECMs	\$12.30	\$23.70	\$65.60	\$53.40	\$154.90
Simple Payback (years) All Feasible ECMs	10	13	15	11	12
Investment Capitalization (years) – All Feasible ECMs Based on 3% Interest Rate	12	17	20	13	16

	ECM Recommended – Primary Recommendation				
	ECM Recommended– Other, feasible if funding permits				
	Not proposed				

The total annual savings across all territories was estimated at \$10M (2022 dollars) at a total investment cost of \$79.6M for the Primary ECMs that were recommended. The total annual savings for all territories including all additional feasible ECMs, again in 2022 dollars, including replacement of all the air conditioning equipment with high efficiency units, and the replacement of all plumbing fixtures with low flow plumbing fixtures, would increase to \$14.2M at a total investment cost of \$177.9M. The implementation of all feasible ECM’s would have a significant positive impact on reducing existing DM with the replacement of associated items.

The total annual savings across all territories was estimated at \$10M (2022 dollars)

Representatives from several organizations were consulted to explore partnering and funding possibilities including the American Samoa Power Authority, Commonwealth Utility Commission, Guam Power Authority, and USVI’s Water and Power Authority. Lighting retrofits were conducted in all territories, and USVI progressed with select upgrades to plumbing fixtures, both of which were conducted outside of the ABCs Initiative.

Based on the site visits and discussions held in 2015 (at the start of Phase 3), it was clear that the availability of funding opportunities to address the DM and to implement the recommended ECM improvements in each school district was very limited. Consideration of Energy Savings Performance Contracts (ESPCs) was recommended as an alternative contracting mechanism that would allow the schools to cover some of the required capital improvements without having to rely on direct government appropriations, tax receipts or bonds (both Guam and USVI had prior experience with ESPCs). The ESPCs use private financing to cover the up-front costs and install and maintain the system improvements, while allowing the sponsoring government entity to repay the loans using the utility savings realized by the improvements over the life of the contracts.

Only USVI had an effective ESPC program in place to support the implementation of energy saving measures and other related improvements within the schools (it is important to note that other DM issues can be addressed with ESPC financing, not just the ECMs). The USVI ESPC program was being administered by the VI Energy Office, managing an ESPC open end contract that covered ESPC work for multiple departments, including the hospital, the port authority, the correctional system, and other agencies besides the school district. VI Energy Office had implemented several projects (paid for with

ARRA funds and bond funds, respectively), that were totaling a savings of over \$4M per year in utility costs. It was determined that additional work could be conducted if the USVI extended the payback period and worked to get a lower interest rate with good credit rating (e.g., from around seven percent to three percent).

American Samoa was in the process of establishing an ESPC program for renewable energy. The local ABCs PM maintained communications with related contacts at the American Samoa Renewable Energy Committee and Power Authority, but funding for school improvements (besides lighting upgrades) were not available during the duration of ABCs Phase 3.

The Guam Power Authority was managing an ESPC program for the territory to implement ECMs at the airport and for other agencies, but GDOE was able to reach agreement with GPA in using the ESPC program due to unfavorable overhead costs and financial responsibilities.

CNMI did not have an ESPC program in place and did not have the finances to implement an ESPC program utilizing their own resources (PSS was delinquent in making utility bill payments to the local utility agency, so the opportunity to borrow money under an ESPC was restricted without federal government backing).

Direct funding for recommended ECMs could help the host agencies move forward with sustainability goals while addressing high priority DM (e.g., installation of photovoltaics paired with roofing repair, or pilot projects for solar-powered ac units).

3 Current Conditions

Rapid facility condition assessments were conducted in 2021 to update the information collected in 2013 for American Samoa and Guam. Findings from these assessments are summarized in Sections 3.1 and 3.2 respectively. Conditions of eight “work activities” were assessed in this update including: Roofing, Exterior, Interiors, Structural, Mechanical, Electrical, Plumbing, and school grounds (Site).

CNMI opted out of the ABCs Initiative in 2019 and USVI chose not to update condition information through the ABCs Initiative because of extensive FEMA-related condition assessments conducted in response to the 2017 hurricanes. DM totals, and the levels of funding required to correct all DM within ten years are shown in Decision Support Tool (DST) projections in Section 3.3.

For the 2021 condition assessment, priority categories were established for each discipline to help differentiate items requiring priority attention (Table 9). Priorities 1 and 2 were flagged as highest priority items that required the most urgent attention.

Table 9 – Priority categories established for each discipline

Discipline\ priority	1	2	3	4	5
Structural	Risk of failure and injury (life safety hazard)	No immediate safety hazard; continued deterioration will cause loss in structural capacity and life safety hazard	Minor structural imperfection, that has little current or projected future impact on the performance of the building		
Architectural	Injury risk	Risk of accelerated deterioration	Functional inadequacies	Requires monitoring	
Electrical	Arcing and major injury risk or death	Minor injury risk	Exposed wires	Uncovered outlets or switches	Inadequate number of outlets
Mechanical	Inoperable or failing system				
Fire Protection	Inoperable or failing system	Inadequate water pressure			
Plumbing	Leaking interior water lines	Broken fixtures			
Site/Civil	Injury risk	Inadequate site infrastructure	Site flooding risk potential	Inadequate emergency access	Non-compliant handicapped access

3.1 Assessment highlights: American Samoa

Assessments at 25 ASDOE schools were conducted in August and September 2021. The Honolulu-based architect and engineering team was unable to travel to American Samoa and be physically present for the school assessments due to Covid-related travel restrictions. The assessments were conducted by the local ABCs PM, with support from ASDOE School Maintenance staff, in coordination with the Honolulu SME team. The four Manua District Schools (Olosega ES, Fitiuta ES, Faleasao ES, and Manua HS) were not assessed due to Covid-19 travel restrictions. ASDOE School Maintenance staff are aware of and are managing DM needs at these schools. Inventory-wide, ASDOE’s FCI was 10% in 2013, to 7% in 2021, and DM dropped from \$12M (in current dollars) to \$6M in this time with \$3.4M in executed DMRP work (in addition to locally funded DM projects).

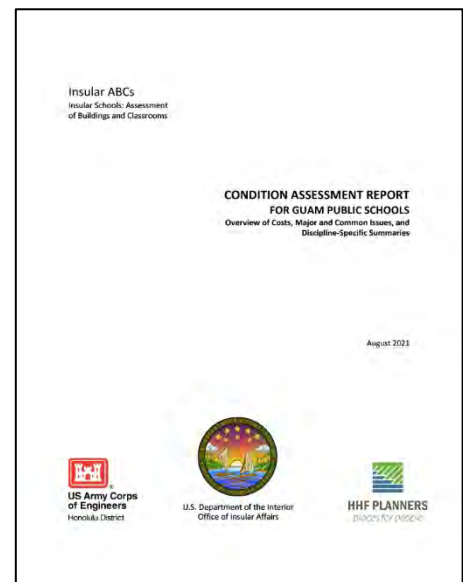


Figure 8 – Condition Assessment Summary

The 2021 assessments identified where major DM investments were needed and rough order of magnitude costs to resolve DM items (not detailed scopes and cost estimates). Facility items inspected in 2013 were reassessed to identify the following changes:

1. Work completed/no remaining DM
2. Condition worsened due to natural aging (i.e., DM repair work is still needed but hasn't significantly worsened beyond what was captured in 2013)
3. Condition significantly worsened/accelerated deterioration—work order update required

DM work orders for about 3,000 facility components at ASDOE schools were updated. About \$3.9 million (M) in DM was identified as complete with about \$5.4M in DM remaining, \$0.3M of which was identified as significantly worsened (Figure 9). Costs for DM that had significantly worsened since 2013 were created using National Cost Estimator software (adjusted as needed based on historic project cost information). Costs for already recorded DM items that worsened due to natural aging were escalated by 2% per year from 2020 dollars (date of the last cost update) to 2022 dollars, per guidance from the team cost estimator and Federal guidance (PAX Newsletter 3.2.2, dated 21 May 2021), with the assumption that early 2022 would provide a reasonable timeframe for investments in DM repair work.

DM was categorized by Work Activity like the building systems used in 2013. Figure 10 shows the distribution of DM costs for each of these categories. The updated DM total is estimated at about \$5.4M.

The 2013 condition assessment estimated a total of \$10M in DM for ASDOE schools. About \$3.9M of DM was identified as removed during the 2021 assessment (i.e., demolished). Comprehensive data on non-ABCs investments made between 2013 and 2021 were not available but ASDOE investments and American Recovery and Reinvestment Act funded repair projects addressed many DM items. The current total highlights that DM continues to accrue and conditions for DM items that are not addressed in a timely manner continue to worsen over time.

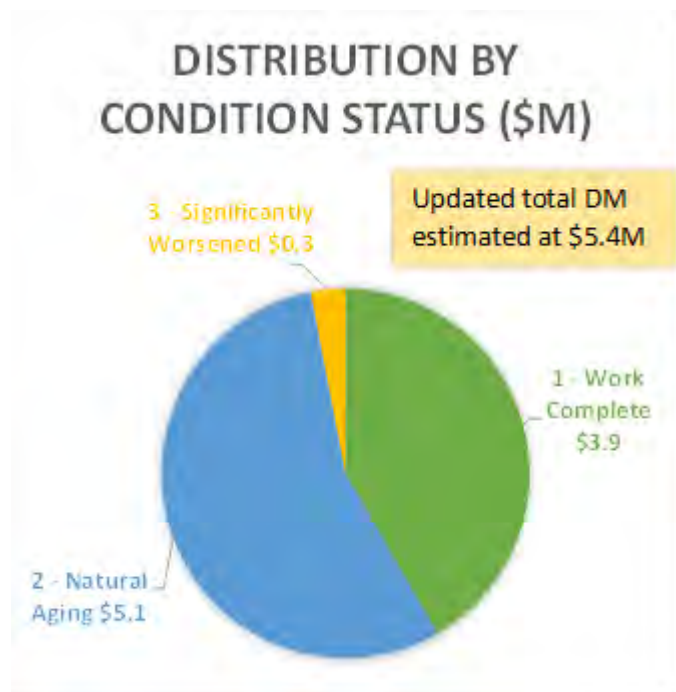


Figure 9 – Distribution of work order costs and percent or work order count by condition status

Immediate attention should focus on Priority 1 and 2 items. About 54 percent of DM identified in 2013 appeared to have worsened due to natural aging (condition status 2). Priority designations were required for all items that were identified as having significantly worsened or showed signs of accelerated deterioration (condition status 3). Only 31 of about 3,000 DM items (1%) were categorized as priority 1 or 2 concerns. The estimated DM cost for priority 1 and 2 items is roughly estimated at \$174,000 and is shown by work activity in Figure 11.

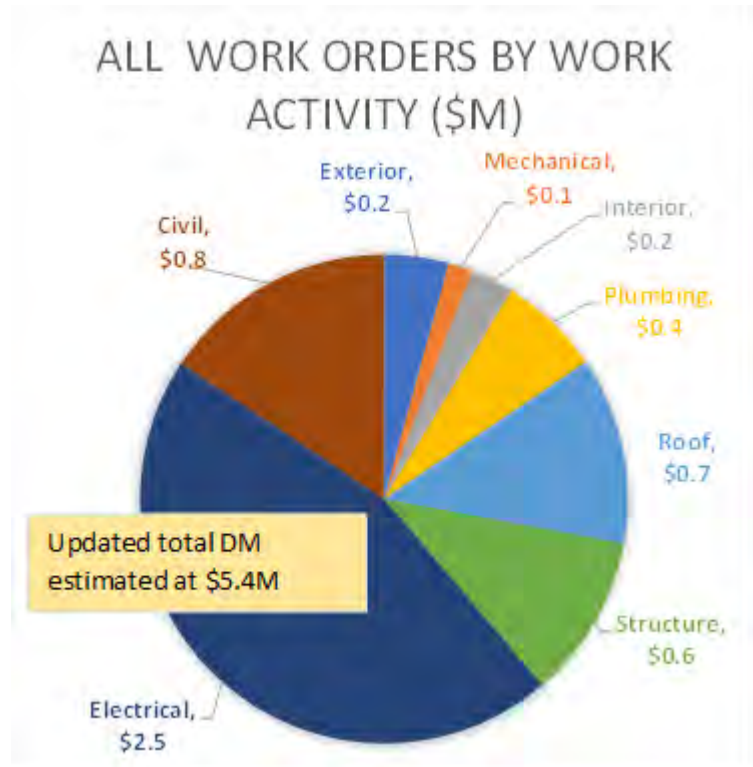


Figure 10 – Work order costs by work activity (\$M)

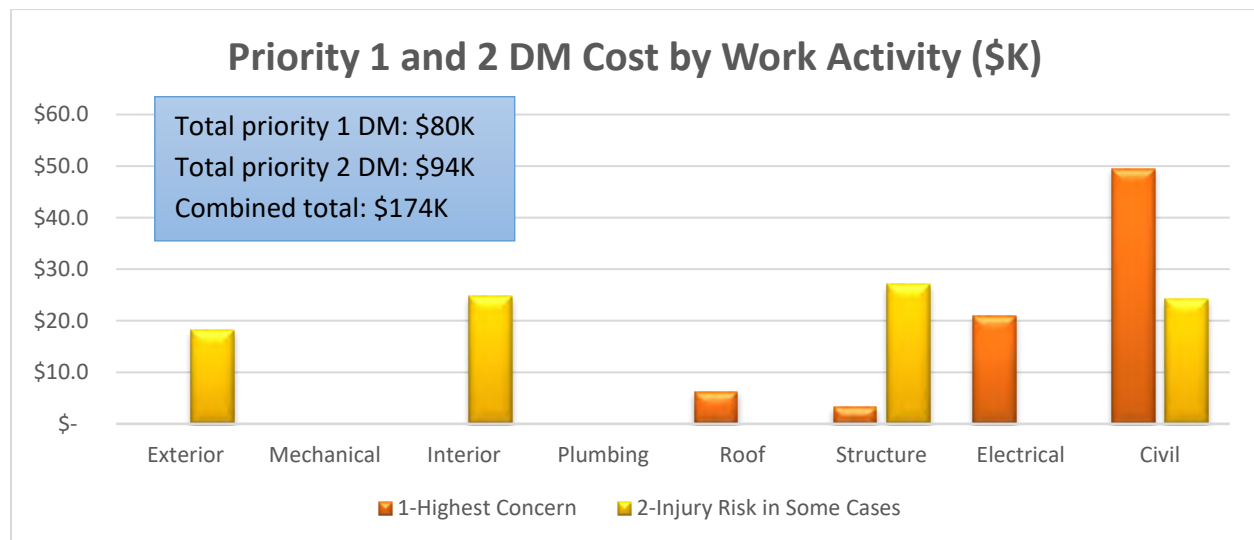


Figure 11 – Priority DM Cost by Work Activity (\$M)

Building enclosure and weather proofing are critical because these elements protect other building systems and elements. Interior finish and some structural issues may be associated with failed building enclosure elements (e.g., roofing material). Leaks that result from failed roofing also introduce

additional moisture into mechanical systems, and can exacerbate corrosion of many elements, including electrical equipment. Civil, or site, issues can lead to building flooding during heavy rains if swales and retention basin are not maintained. Major and common problems are summarized by discipline in the Condition Assessment Report.

ASDOE’s facility master planning process was ongoing during the 2021 condition assessment. The FMP considered DM needs and facility redevelopment alternatives that could affect the DM estimates provided in this report (e.g., demolishing structures that have high DM costs will reduce the overall DM total).

School DM costs per square foot (SF), to normalize school DM costs by school size, are shown in Figure 12. Costs range from \$0.20/SF at Fagaili ES (ASDOE’s newest school) to \$25.60/SF at Olosega ES (Manua schools were not reassessed in 2021, but DM understood to still exist and recorded in the EAMS database was escalated to 2022 dollars and included in DM summaries; Manua schools had the highest DM costs per SF).

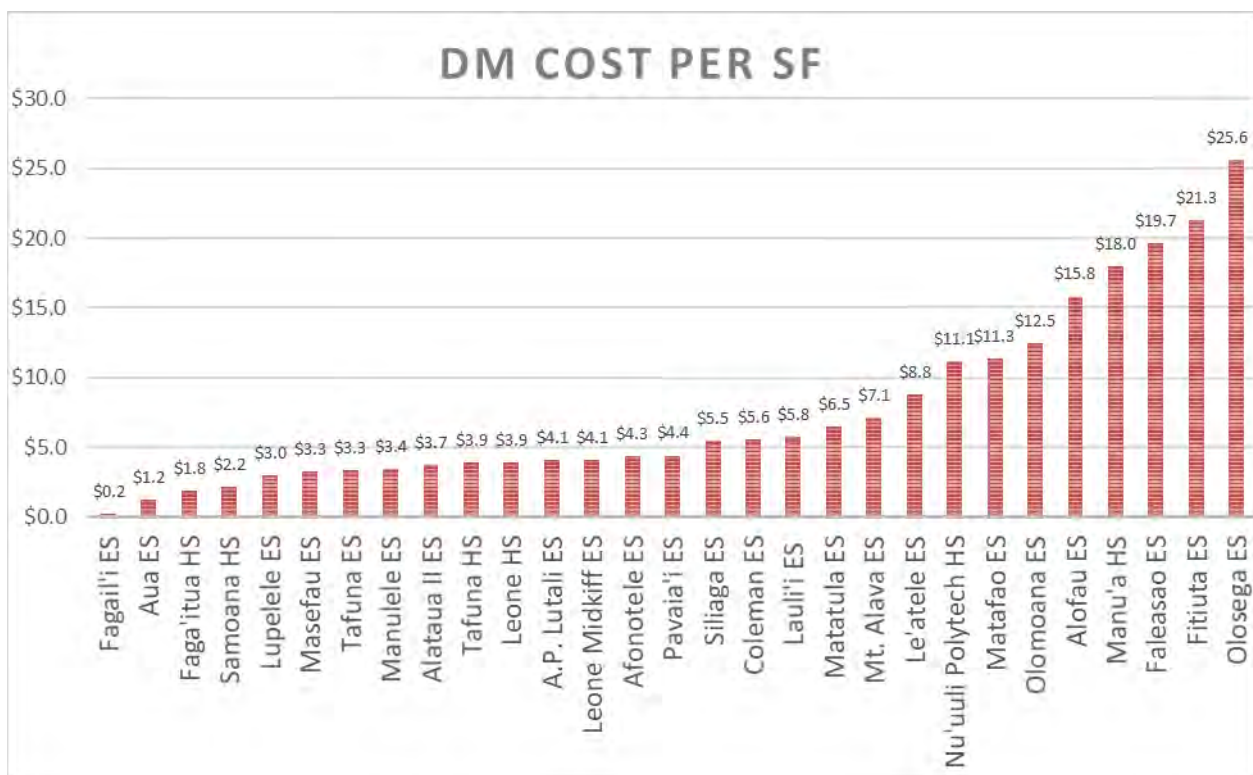


Figure 12 – School DM Cost per SF – ASDOE

The American Rescue Plan (ARP) and Coronavirus Aid Relief, and Economic Security (CARES) Act funding provide rare opportunities to resolve H/S DM issues and transition to a preventive-maintenance-based approach to facility maintenance. At the time this report was prepared, ASDOE had a facility master

planning process underway that would capture information from the condition assessments and provide planning for capital improvement program (CIP) projects based on capacity analysis, needed facilities based on revised school standards, and addressing DM, particularly for high priority H/S concerns.

3.2 Assessment highlights: Guam

Guam public school assessments were conducted from May through June 2021 and covered 34 GDOE schools excluding the six leased schools (because maintenance is the responsibility of the lessor), FQ Sanchez (closed), and JP Torres because the campus is not being used (classes moved to Southern HS).

As was done for assessments in American Samoa, three categories were used to update the conditions identified for facility items inspected in 2013:

1. Work completed/no remaining DM
2. Condition worsened due to natural aging (i.e., DM repair work is still needed but hasn't significantly worsened beyond what was captured in 2013)
3. Condition significantly worsened/accelerated deterioration—work order update required

The DM work orders were created for the main components of the facility inventory for the 34 GDOE owned and managed facilities, a total of about 11,000 DM items. About a third of DM items were repaired, about 6% of DM items significantly worsened, and about 58% of items worsened due to natural aging (see Figure 13).

DM was categorized by Work Activity like the building systems used in 2013. Figure 14 shows the distribution of DM costs for each of these categories. The updated DM total is estimated to be about \$107M.

The 2013 condition assessment estimated a total of \$90M in DM for GDOE managed schools (this total also included FQ Sanchez and JP Torres that were

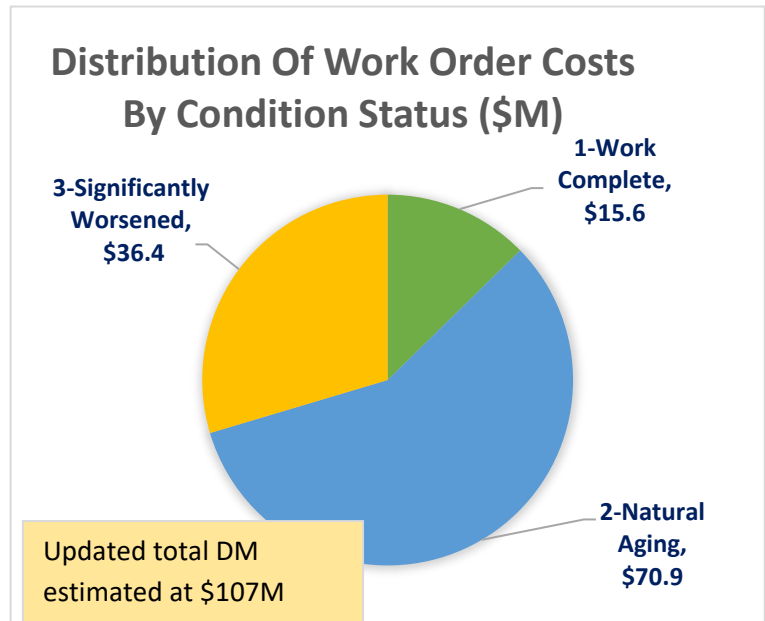


Figure 13 – Distribution of work order costs and percent or work order count by condition status

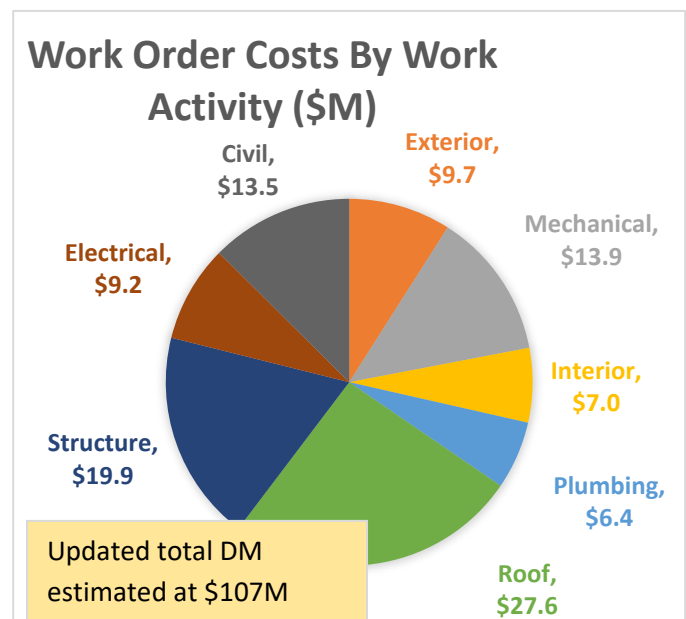


Figure 14 – Work order costs by work activity (\$M)

assessed in 2021 because these campuses are not in use). Clear and comprehensive data on investments made between 2013 and 2021 were not available but is assumed to be more than \$15M, including several millions of dollars of American Recovery and Reinvestment Act funded repair projects around the time of the Phase 2 assessments. The current total underscores that DM continues to accrue and conditions for DM items that are not addressed in a timely manner continue to worsen over time.

GDOE indicated their intention to focus immediate attention on priority 1 and 2 items. As shown in Figure 9, about two thirds of DM identified in 2013 appears to have worsened due to natural aging (condition status 2) about 2,000 of related DM items were categorized as priority 1 or 2 concerns. Indication of priority was required for all items that were identified as having significantly worsened or show signs of accelerated deterioration (condition status 3). The estimated DM cost for priority 1 and 2 items totals \$70M and is shown by work activity in Figure 15.

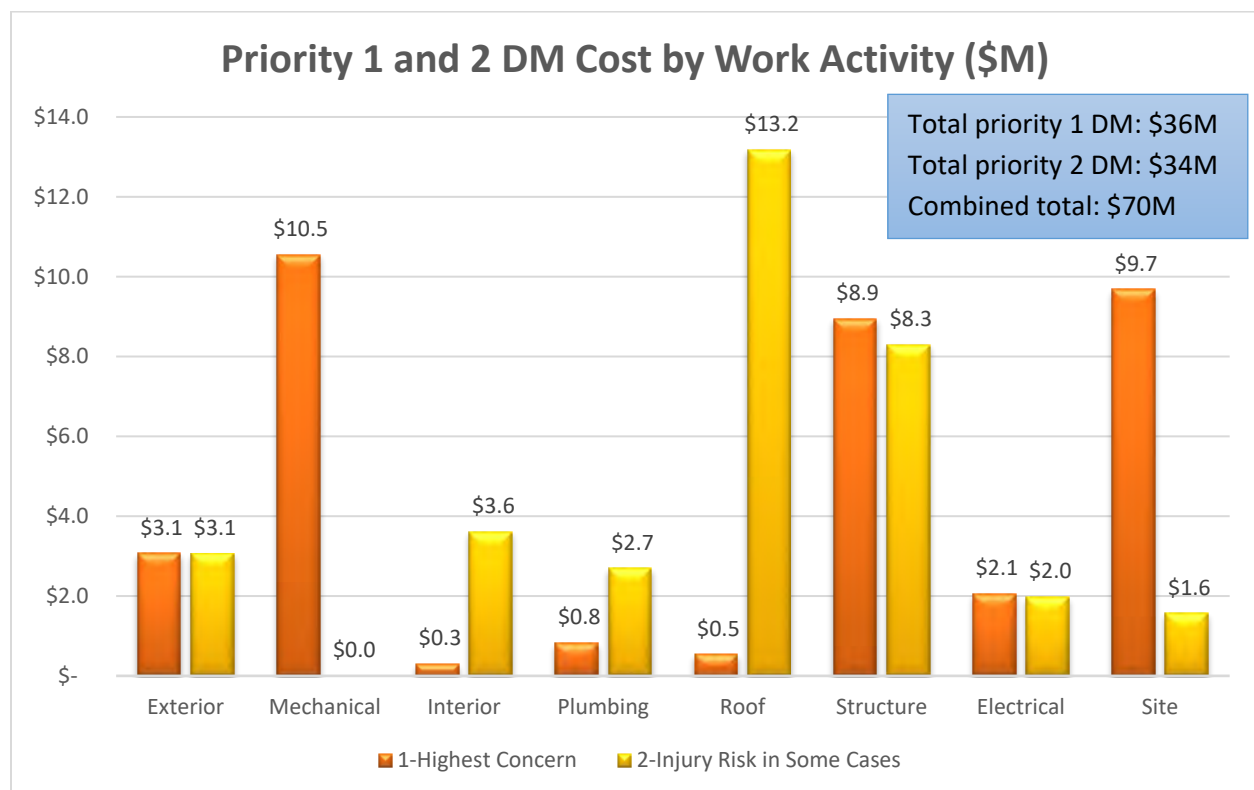


Figure 15 – Priority DM Cost by Work Activity (\$M)

School DM costs per SF, to normalize school DM costs by school size, are shown in in Figure 16. Costs range from \$15/SF at Maria Ulloa ES to about \$80/SF at Merizo Martyrs ES.

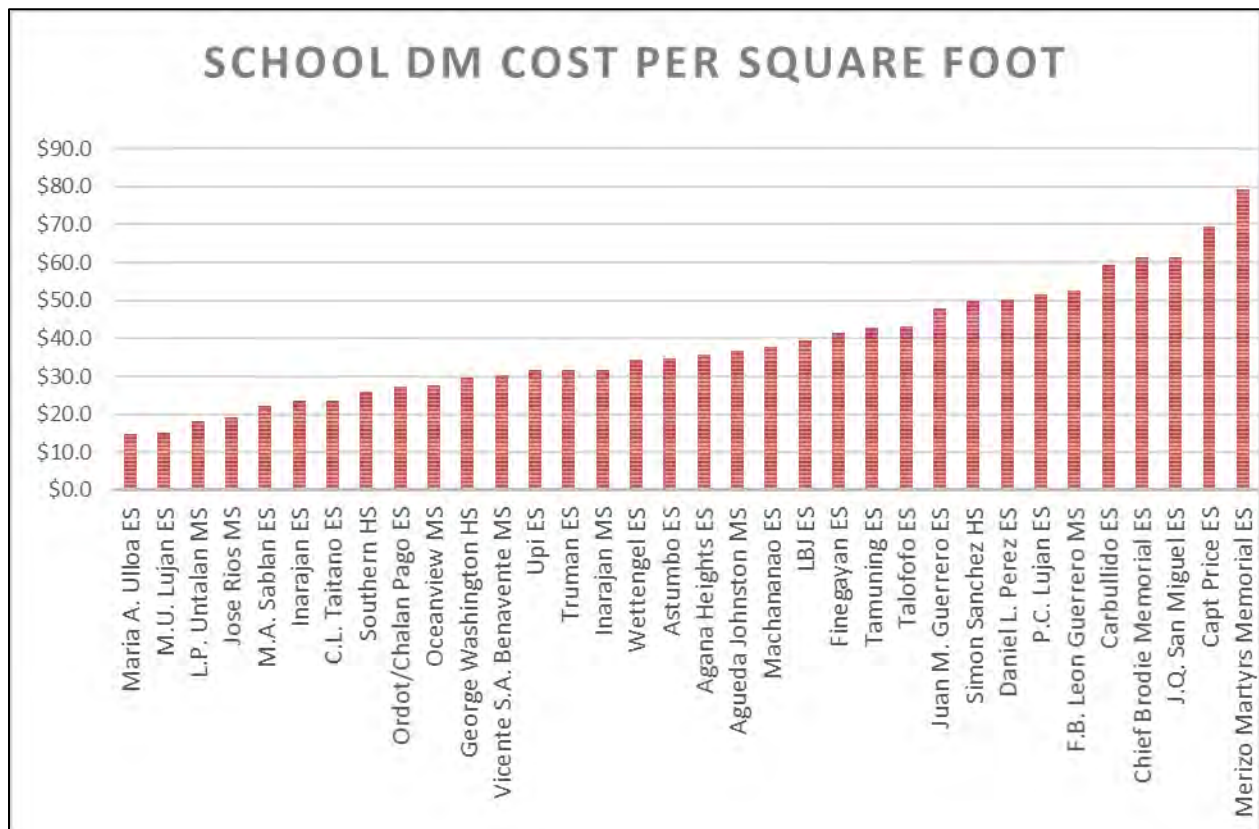


Figure 16 – School DM Cost per SF – Guam

APR and CARES Act funding provide significant and rare opportunities for GDOE as well to resolve H/S DM issues and transition to a preventive-maintenance-based approach to facility maintenance. At the time this report was prepared GDOE had a facility master planning process underway that would capture information from the condition assessments and provide planning for CIP projects based on capacity analysis, needed facilities based on revised school standards, and addressing DM, particularly for high priority H/S concerns.

3.3 DST Projections

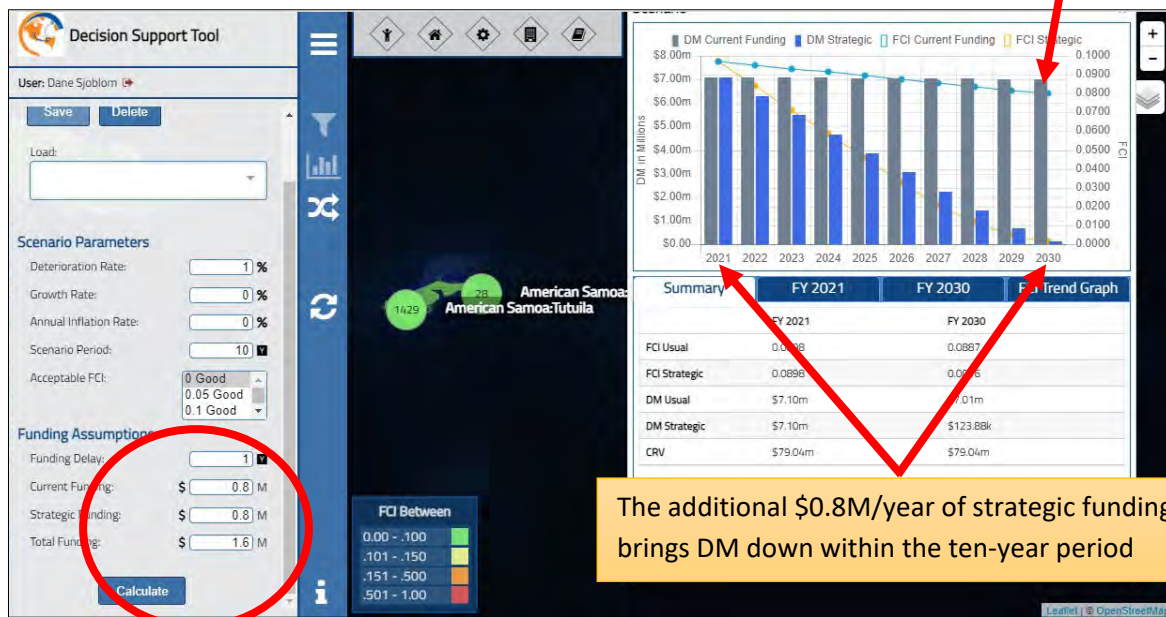
The DST (Decision Support Tool) is a geospatially enabled web tool that allows users to easily view and analyze information in their EAMS database. Fully integrated with IBM Maximo® (the core EAMS program), the DST combines interactive, color-coded maps, charts, and graphs to visualize real-time, operational data in an easy-to-understand dashboard format. One key feature of the DST, the Scenario Tool, allows users to set parameters and funding assumptions to estimate how various levels of funding will affect DM totals over define periods of time, displayed on a map widget. Scenarios can be named and saved for review (e.g., for briefing school district administrators). Figures 17 through 20 display funding scenarios that allow host agencies to eliminate all DM within 10 years. For these examples,

growth rate (an estimated percentage increase of facility floor area per year) and annual inflation rate are set a zero. Most agencies can determine appropriate factors for these when running scenarios.

3.3.1 American Samoa

Figure 17 shows continued DM funding needed for ASDOE. The gray bars depict current funding, and the blue bars show the change with the addition of strategic funding.

\$1M in maintenance funding has little overall effect on DM over ten years.



The additional \$0.8M/year of strategic funding brings DM down within the ten-year period

Assuming \$1M dedicated and \$0.8M “strategic” funding

Figure 17 – Scenario Tool: Funding Required for ASDOE

ASDOE’s school maintenance budget is about \$800,000 per year (net of DMRP funds), and about double that amount is required to address all DM in 10 years. The CRV of ASDOE schools shown in EAMS is about \$80M. Per the National Research Council (1990), a sustainable steady state maintenance budget should be in the range of two to four percent of the CRV of an organization’s inventory, depending on the age of the facilities and construction materials used. This means that ASDOE’s school maintenance budget should be in the range of \$1.6M to \$3.2M. ASDOE’s current budget is about half to one quarter of the national benchmark.

3.3.2 CNMI

Figure 18 shows funding needed for the CNMI Public School System (PSS) to address all existing DM based on the latest information captured by the ABCs Team in 2018 (prior to CNMIs departure from the ABCs program in 2019). The gray bars depict HHF’s understanding of PSS’s maintenance budget in 2018, and the blue bars show how the DM backlog would change with the addition of strategic funding.

\$2M in maintenance funding has little overall effect on DM over ten years.



The additional \$1.9M/year of strategic funding brings DM down within the ten-year period

Assuming \$2M dedicated and \$1.9M “strategic” funding

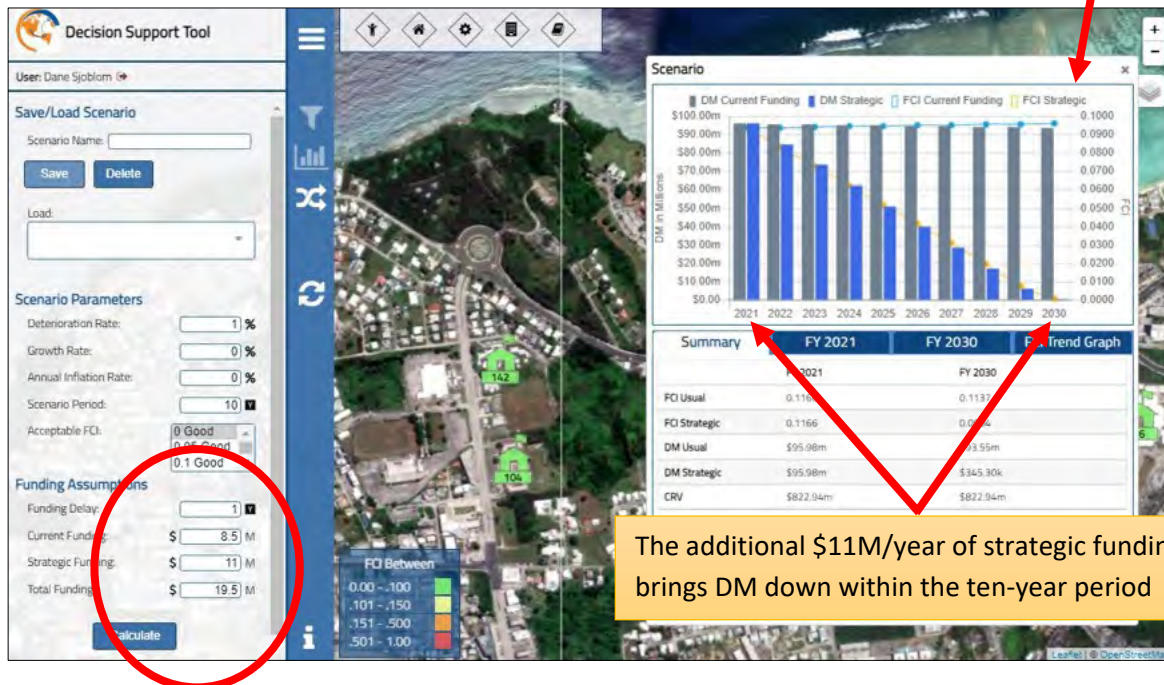
Figure 18 – Scenario Tool: Funding Required for CNMI

Maintenance funding for PSS, analyzed in the Organizational Sustainability Plan (HHF, 2017), was about \$2M in 2017 (updates to this information are not available because of PSS’s withdrawal from the program in 2019). Like ASDOE, PSS required about twice the 2017 maintenance funding to address all DM within ten years. The CRV for PSS schools shown in EAMS, as of 2018 in current dollars, is about \$174M. Estimating a healthy maintenance budget at two to four percent CRV (National Research Council, 1990), it is assumed that PSS should be budgeting \$3.5 to \$7M per year (actual current DM and funding totals are not known). Funding as of 2018 (latest information available to HHF) is about 60 to 30 percent of the national benchmark. As captured in the Organizational Sustainability Plan (HHF, 2017), PSS’s budget depended on annual appropriations which add uncertainty. Dedicated maintenance funding is essential for supporting a sound maintenance program.

3.3.3 Guam

Figure 19 shows funding needed for GDOE to address all existing DM by 2030. The gray bars depict current funding, and the blue bars show the change with the addition of strategic funding.

\$8.5M in maintenance funding has little overall effect on DM over ten years.



Assuming \$8.5M dedicated and \$11M “strategic” funding

The additional \$11M/year of strategic funding brings DM down within the ten-year period

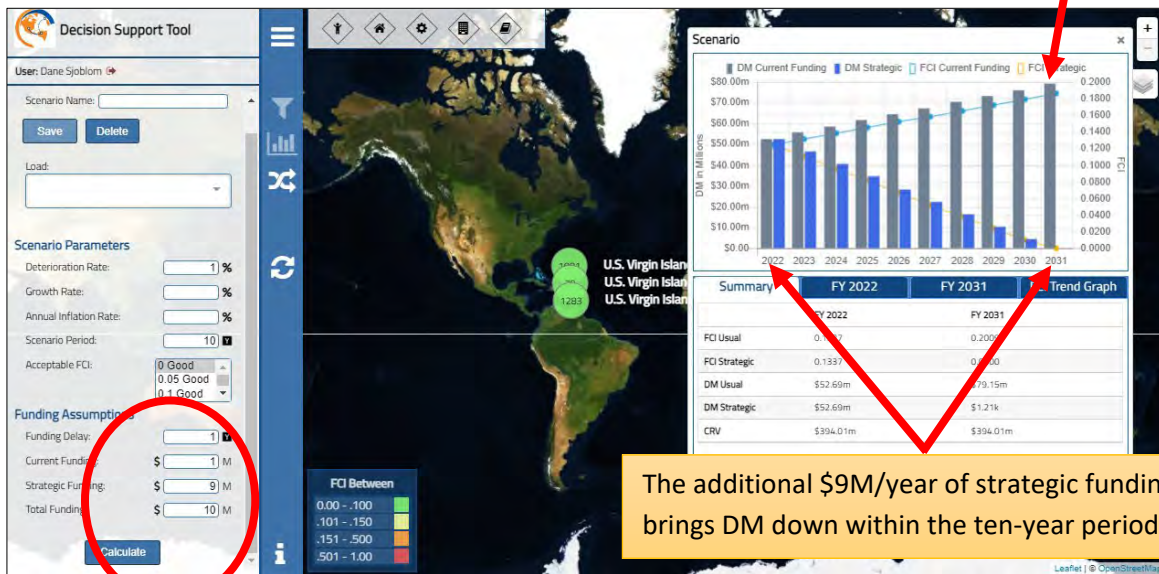
Figure 19 – Scenario Tool: Funding Required for Guam

GDOE’s school maintenance budget was in the \$7-8M range for the last several years (not including capital outlay) and recently has dropped to under \$7M (HHF, 2021). Similar to other territories, more than twice the current maintenance budget is needed to address all DM within ten years. CRV for the 34 GDOE-managed schools is about \$823M. Estimating a maintenance budget of two to four percent CRV (National Research Council, 1990), GDOE should be budgeting between \$16 to \$32M per year. Current funding is about 20 to 40 percent of the national benchmark. GDOE’s maintenance budget is inadequate for current needs and does not include funding for a preventive maintenance program.

3.3.4 USVI

Figure 20 shows funding needed for VIDE to address all existing DM by 2030. The gray bars depict current funding, and the blue bars show the change with the addition of strategic funding.

\$1M in maintenance funding is not enough; DM continues to accrue over the scenario period.



The additional \$9M/year of strategic funding brings DM down within the ten-year period

Assuming \$1M dedicated and \$9M “strategic” funding

Figure 20 – Scenario Tool: Funding Required for VIDE

VIDE accounting records show that maintenance funding is limited to about \$500,000 per district annually (HHF, 2021). Figure 20 shows that this is not enough to manage current DM levels. The disparity between what is currently budgeted, and the amount needed to address all DM within ten years is more severe than the other territories. About ten times the existing budget is needed. The CRV for VIDE schools is estimated at \$394M, so a maintenance budget of two to four percent CRV (National Research Council, 1990), would be about \$8 to \$16M per year. Current funding is about 13 to 6 percent of the national benchmark. GDOE’s maintenance budget is inadequate for current needs and does not include funding for a preventive maintenance program.

4 EAMS Transition

EAMS buildout was largely complete in the middle of ABCs Phase 3 (except for CNMI PSS that chose to go with a different system) and was updated as projects were completed, old buildings demolished, and new buildings constructed. Transitioning to host agency management required that the host agencies

purchase servers (local or cloud-based). This effort was delayed despite years of notices and reminders about the requirement and options to host agency heads and IT points of contact throughout Phase 3 with more focused action requests and cross training in 2018. Transition also required host agencies to identify an in-house administrator, data entry staff, and facility manager that would provide oversight to ensure that the data in the system remains current and useful. ABCs proponents were hopeful that the ECs in each territory, however, as EAMS administration transitioned, these individuals moved on to other pursuits. Delays with IT purchases were compounded with host-agency delays in identifying and positioning staff for EAMS use and management. The arrival of the Covid-19 pandemic halted many host-agency actions while the focus of their efforts shifted to on-line education, retrofitting buildings to be safer, and managing work from home requirements.

By the middle of 2021, GDOE and VIDE had stood up servers and system separation and deployment had begun. ASDOE reached this milestone around October 2021. GDOE was the first to confirm trainees and complete the training program, followed by VIDE. ASDOE completed EAMS training in February 2022. All three territories demonstrated proficiency in system use and were managing the system on their own by March 2022.

4.1 EAMS Training

EAMS training was conducted in a sequence of iterative, module-based training sessions, to provide regular opportunities for demonstrations, quality control, and refreshers to promote practice with system use and operating procedures. Training was provided at several junctures in the EAMS development process including orientations for senior managers and outreach to school administrative staff involved in processing service requests/trouble calls (host agency staff turnover was problematic as staff that received training would leave for other positions). ABCs PMs assisted with coordination and training. Training began with introductory briefings and demonstrations with intermittent check ins to confirm that host agency users were comfortable with the system.

In the Year 4 and 5 timeframe, twenty distinct sessions were identified in the proposed training schedule. Some sessions were grouped depending on the complexity of the lesson and trainee absorption. Trainees picked up the material quickly and refreshers were provided as needed as trainees began practicing and attempting data updates on their own. Training timeframes for each territory were:

- ASDOE: December 2021-February 2022
- GDOE: October-November 2021
- VIDE: November-December 2021

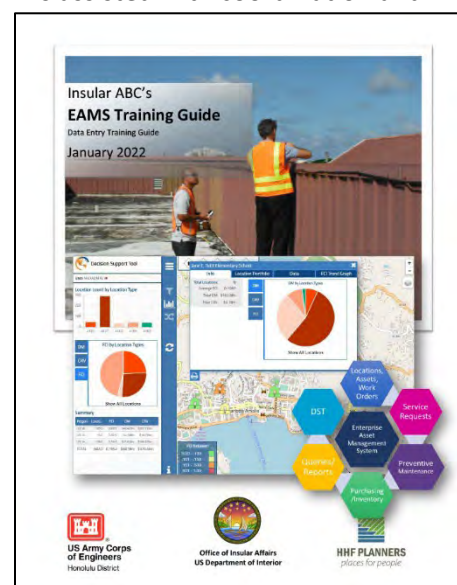


Figure 21 – EAMS User Manual

The ABCs team provided oversight throughout training and remained in contact with host-agency EAMS administrators after training sessions were completed, to ensure a smooth transition.

4.2 EAMS Workflows

Training and overall transitioned focused on clarifying EAMS workflows with host-agency contacts. Steps for EAMS use and focus areas for training included:

1. Service requests: receive and dispatch school service requests for emergency work (or add to planned work)
2. Work order management: Coordinating and tracking status/data for preventive maintenance tasks, planned in-house maintenance and repairs, and contracted projects for work
3. Asset Inventory management: updating asset information for equipment that gets replaced, decommissioning buildings, or creating new locations for new construction.
4. Reporting: using work order and DM data to provide reports on resource expenditures to host agency leadership to assist in communication budget needs and communicating with schools on conditions and repair plans.

These steps are shown in Figure 22.

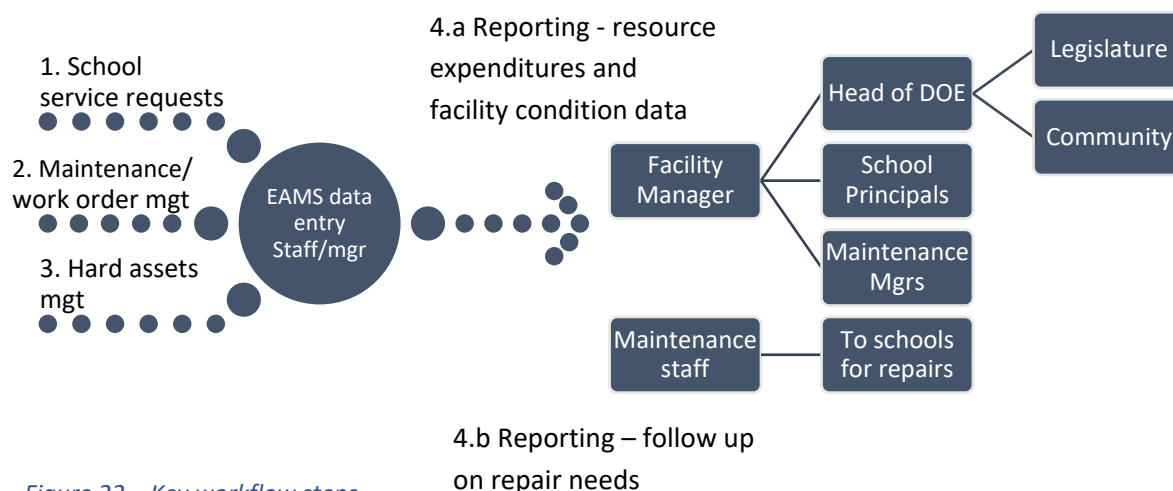


Figure 22 – Key workflow steps

Workflows, confirmed by host-agency EAMS administrators, include:

1. Service Desk: School and EAMS data entry staff tasks
 - a. Selected school point of contact: submits service requests in EAMS service desk.
 - b. Host agency EAMS Administrator and support staff: Check service desk for new (or unaddressed) service requests in EAMS, update statuses as needed, ensure all fields are accurately completed (location, classification of work, priority, summary of work needed/completed, start/completion times).
2. Work order management
 - a. Host agency facility manager/maintenance supervisors:

- i. Define the work classifications and preventive maintenance tasks assigned to each staff
 - ii. Provide staff updates to host agency EAMS Administrator and support staff
 - b. Host agency EAMS Administrator and support staff:
 - i. Receive and dispatch school service requests/emergency work
 - ii. Preventive maintenance tasks, planned in-house maintenance and repairs, and contracted projects for work
- 3. Asset management
 - a. Host agency facility manager/ maintenance supervisors:
 - i. Provide asset update data to Host agency EAMS Administrator and support staff
 - b. Host agency EAMS Administrator and support staff:
 - i. Inventory management such as updating asset information for equipment that gets replaced, decommissioning buildings, or creating new locations for new construction.
- 4. Reporting – resource expenditures and facility condition data
 - a. Host agency EAMS Administrator and support staff: using work order and DM data to provides high level summary reports on maintenance at all VIDE facilities to host agency leadership group and facility manager/maintenance supervisors to assist in communication budget needs (e.g., resource expenditures for in-house labor, preventive maintenance, CIP, trouble calls, etc.).
 - b. Host agency leadership group: use EAMS data to create budget requests and justification for budget hearing with local legislature
 - c. Host agency facility manager/maintenance supervisors: use work order data to communicate with schools on responsiveness/service satisfaction, planned work, and resource allocations

In addition to confirming workflows, trainees identified a few areas that needed additional instruction in the EAMS user guides including:

1. Associating a newly created school location with the primary system and buildings (i.e., establishing the parent/child relationship within EAMS)
2. Steps required for decommissioning buildings, including cancelling all workorders and removing assets
3. Preliminary steps needed for administrators to be able to add new users to security groups.

All updates were made to the respective user guide and revised guides were sent to all EAMS trainees. User guides include:

1. EAMS Administrator Guide
2. Data Entry User Guide
3. School User Guide (with school information packet: EAMS websites, login credentials, list of building (i.e., “location”) IDs, and school site maps with location IDs for reference)

All school users were trained by HHF EAMS PMs except for VIDE schools that will be trained by VIDE staff at their request.

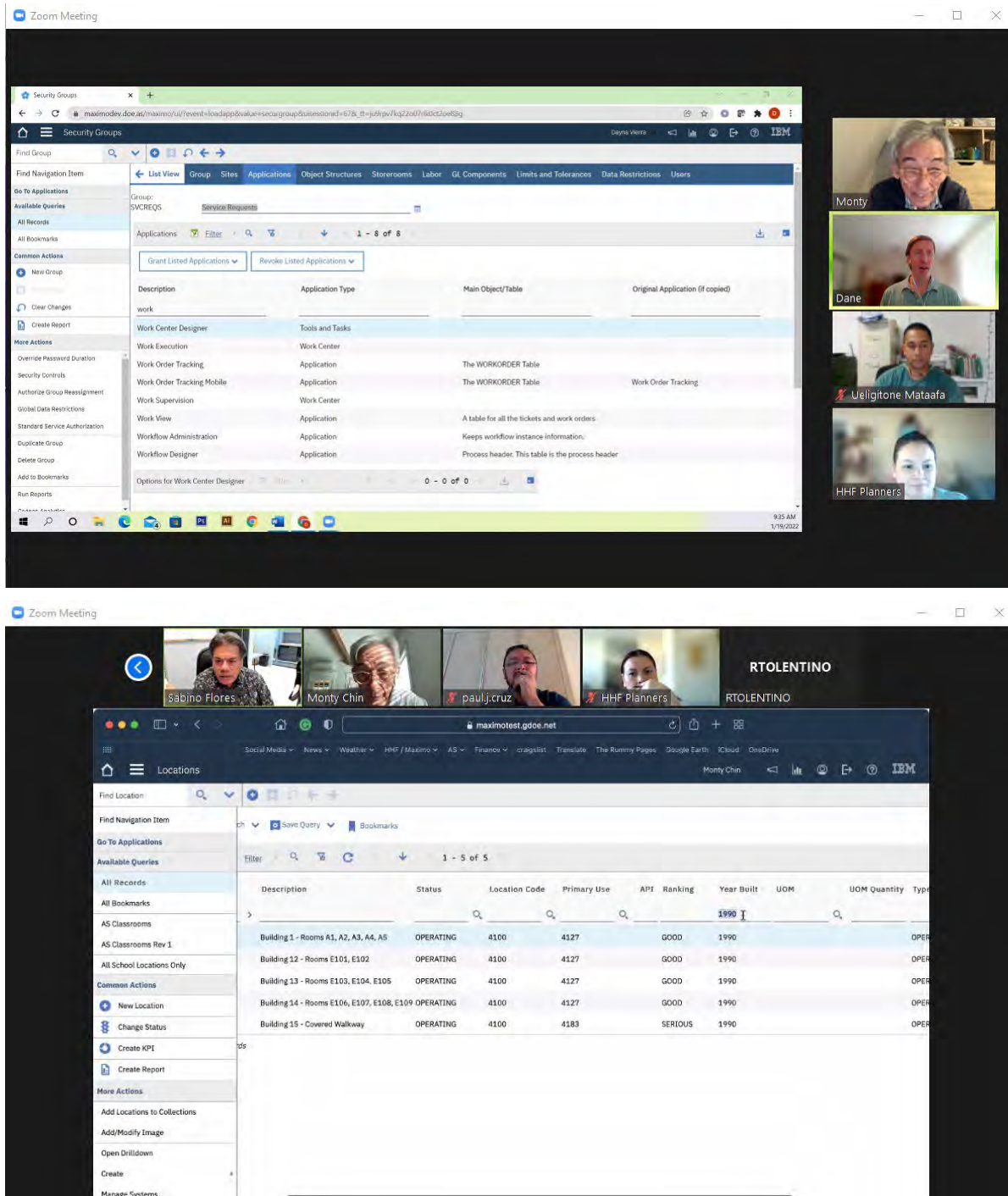


Figure 23 - EAMS training session on Zoom

5 Organizational Sustainability Plan Status

Organizational Sustainability Plan (HHF, 2017) status updates were provided in the Year 4 report. These reports, created in collaboration with the host agencies of each territory, identify actions that could boost school facility management practices with three focus areas: O&M, funding, and planning. OSP actions undertaken in Year 5 were focused on completing the preventive maintenance plans for ASDOE, GDOE, and VIDE and supporting the creation of FMPs for GDOE and ASDOE.

5.1 Overview summary

Most of the progress made in Year 4 and 5 with the 34 OSP recommendations that were common between territories was associated with EAMS deployment, preventive maintenance plan creation, and facility master planning. An update to the summary OSP recommendations status graphic provided in the Year 4 report is shown in Figure 25. Color coding in Figure 20 indicates the extent to which the host agencies have demonstrated proficiency, the lightest green shows areas where additional support could help, medium green indicates progress is being made, and the darker green was used for areas that are no longer a concern.

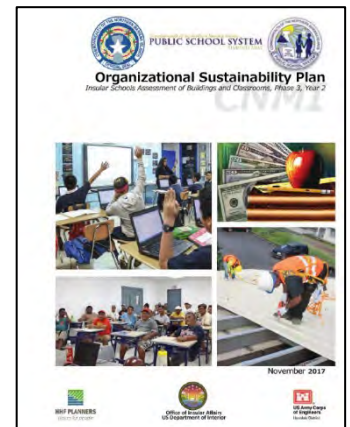
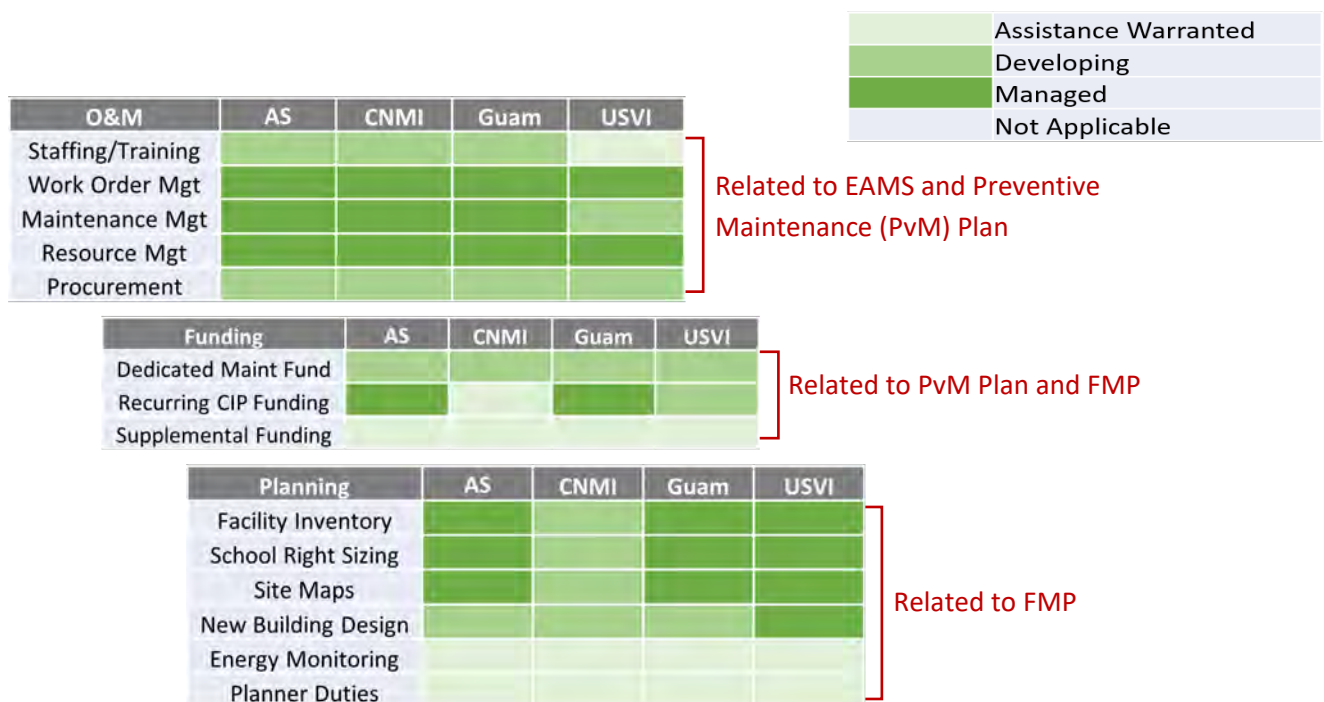


Figure 24 – Organizational Sustainability Plan



*CNMI progress as of mid-2019 when it left the ABCs Initiative

Figure 25 – OSP Status by Action Category

5.2 Preventive Maintenance Plans

Preventive maintenance plans were created in collaboration with ASDOE, GDOE, and VIDE to document critical actions that should be undertaken to ensure that the host agency’s facilities, infrastructure, and equipment remain viable, and that facility and equipment investments are maximized. The plans captured key preventive maintenance tasks and summary steps for execution, task frequencies and resource estimates, and reviews of existing management and staff positions, conditions, and recommendations for adjustments. Summaries of resource needs, current budgets, and organization and management structure change recommendations are provided for ASDOE, GODE, and VIDE.

The following sections identify the resource needs for preventive maintenance program execution (identified as “resource needs” below), indication of the staffing requirements assuming a stated percentage of staff time was focused on preventive maintenance tasks, and recommendations for staffing adjustments (i.e., organization and management structure change recommendations).

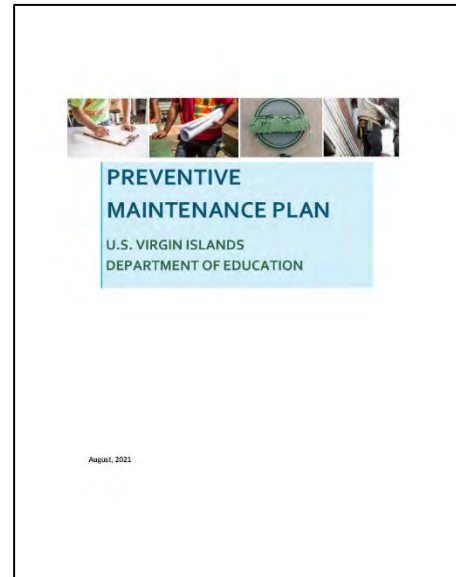


Figure 26 – Preventive Maintenance Plan

5.2.1 American Samoa

Resource needs:

- 20,674 hours for maintenance work done on a yearly basis (11 person years; excluding 57,072 hours for patching and painting every five years (i.e., not annual)).
 - 11,586 hours (6 person years) for in-house maintenance work
 - 9,088 hours (5 person years) assumed to be contracted out (about \$1M per year)

Analysis of School Maintenance’s current staffing was conducted, considering hours needed by maintenance staff position, to assess their ability to cover this work in addition to current maintenance and trouble call tasks. Additional staff positions were found to be warranted.

Organization and management structure change recommendations:

To help balance School Maintenance’s ability to cover PM along with other duties, two scenarios were provided for meeting current staffing needs:

1. Adding 3 carpenters and 1 electrician positions (whose time would be 100% dedicated to PM), with existing maintenance staff dedicating about 50 percent of work time to PM.
2. Adding only 2 carpenters (100% PM), with existing maintenance staff dedicating about 70 percent of work time to PM.

5.2.2 Guam

Resource needs:

- 175,100 labor hours for the needed preventive maintenance work, all of which would be contracted to local service providers (84 person years; estimated to be about \$4M)

Analysis of current maintenance and facility management for GDOE included consideration of an overall shift from in-house to contracted work which requires major organizational changes that could be implemented over time as staff retire or leave GDOE for other jobs.

Organization and management structure change recommendations:

Based on interviews with facility management staff, observations, and the findings of analyses conducted for the preventive maintenance report, the following recommendations were proposed to help build efficiencies in GDOE facility management and sustainability in associated programs and processes. These included creating a new Deputy Superintendent position to oversee GDOE's existing divisions of CIP and Facilities Maintenance. This new position will provide for direct reporting and accountability to the GDOE Superintendent, effective supervision of the CIP and FM Managers, and direct responsibility for management of the CIP and FM approved annual budgets. This new position will also elevate the importance of the CIP and FM divisions to the level of GDOE's other major divisions and facilitate communications between the Deputy Superintendents of related divisions such as Finance and Administrative Services, and Assessment and Accountability.

Other recommendations, including new, revised, reduced, or adjusted positions, were made for the Office of the Deputy Superintendent for CIP and FM, CIP Division, FM Division

Office of the Deputy Superintendent for CIP and FM

- Creation of an Administrative Support Section and establishment of an Administrative Officer position. This will provide a dedicated position for all administrative functions to include support to the Deputy Superintendent in the management of the division's annual operations budget.
- Creation of a Work Control Center for EAMS operation and establishment of Program Coordinator III, Data Control Supervisor and Data Control Technician positions to staff it. This will provide for staffing dedicated to the operation of the FM Maximo work order system.

CIP Division

- Establishment of an Engineer III position to replace the current CIP Manager position. This will provide for an engineering position to manage the capital improvements program.
- Create a Planning section and establish a Planner II position. This will provide for a position dedicated to the planning responsibilities in the development of CIP projects. These responsibilities include tracking enrollment and school capacities, tracking proposed housing developments for projected enrollment increases in affected school districts, analyses of school utilities consumption data for potential energy conservation projects, planning of

school formal condition assessments for adequacy of facilities, and establishment of prioritization protocol for facility investment based on the output of the FMP process.

- Create a Construction Quality Control Section and establish a Construction Inspector III position. This will provide a position with the appropriate technical knowledge of construction standards and construction inspection experience in electrical, mechanical, and civil work necessary for the proper observation of construction contract requirements and quality of work.
- Replace current Program Coordinator III positions with two Engineer II positions. This change will enable the hiring of staff that can more effectively develop and manage CIP projects. Qualification requirements for these positions will include the necessary technical knowledge, project scoping, cost estimating and project management capabilities in the electrical, mechanical, and civil disciplines.

FM Division

- Reduction of current Building Maintenance Superintendent (BMS) positions. This will provide for a sole BMS to have direct responsibility for the operations of the various trade groups and immediate supervision of the trade group supervisors.
- Elimination of current Building Maintenance Supervisor position. Supervisor positions in the respective trades would better serve the needs of the respective section's personnel in lieu of Building Maintenance Supervisor positions.
- Establishment of two Engineer II positions in Contract Management Section. This change will enable the hiring of staff that can more effectively manage preventive maintenance and facilities repair contracts. Personnel in these positions will possess the necessary technical knowledge and contract skills for outsourced preventive maintenance and repair services.
- Establishment of supervisor positions that report directly to the sole BMS (to provide for needed and currently lacking supervisory positions):
 - Carpenter Supervisor (under a new Carpentry Group Section)
 - Electrician Supervisor
 - Refrigeration Mechanic Supervisor

These proposed changes include removing 30 and adding 2 maintenance positions, for a total of 23 maintenance positions over time (e.g., as staff retire to take other jobs) as facility maintenance continues to be outsourced. Proposed changes include restructuring facility management and the creation of new positions to help oversee outsourced contracts and other facility management responsibilities.

5.2.3 UVS

Resource needs:

The preventive maintenance plan for VIDE findings for preventive maintenance work and resources required are summarized below in two groups: 1. St. Croix; 2. St. Thomas and St. John:

St. Croix

Thirty-five basic tasks and frequencies (e.g., annual, semi-annual, and monthly) were defined along with locations where the work should occur. Labor resources required to conduct this work were divided into work that could be done in-house, and work that would be contracted to local service providers. It was estimated that 3,666 hours a year (approximately 2 person years) would be needed for in-house preventive maintenance work, which is estimated to cost approximately \$125,000 in 2021 dollars. Contracted work was estimated to cost about \$1.7M in 2021 dollars.

St. Thomas and St. John

Thirty-six basic tasks and frequencies were defined along with locations where the work should occur. Labor resources required to conduct this work were broken up into work that could be done in-house, and work that would be contracted to local service providers. It was estimated that 4,374 hours a year (two person years) would be needed for in-house preventive maintenance work, which was estimated to cost approximately \$149,000 in 2021 dollars. Work that would be contracted out was expected to cost approximately \$1.7M in 2021 dollars.

Analysis of VIDE's current maintenance staffing indicated that additional positions are warranted to provide adequate coverage for execution and oversight of preventive maintenance tasks.

Organization and management structure change recommendations:

To help balance School Maintenance's ability to cover preventive maintenance along with other duties, the following staffing additions were recommended:

1. One Refrigeration Engineer be added for St. Croix (whose time would be 100% dedicated to PM), with existing maintenance staff dedicating about 50 percent of work time to preventive maintenance.
2. One Refrigeration Engineer to be added for St. Thomas and St. John (whose time would be 100% dedicated to preventive maintenance), with existing maintenance staff dedicating about 50 percent of work time to preventive maintenance.

5.3 Facility Master Plans

School FMPs were prepared for ASDOE and GDOE to establish the goals, standards and investment priorities for the public schools of each territory. This information was used to help assess the adequacy of the schools and identify improvements that are needed to meet the communities' education program goals.

The FMPs provide prioritized implementation plans for facility improvements across the ASDOE and GDOE school facility inventories and serve as resources to support funding requests. The plans provide a road map to ensure that improvements and changes to buildings support current and future teaching and learning modalities.

The planning effort was organized into three major Milestones (see Figure 28). Each Milestone included a stakeholder workshop to vet new material, exchange ideas and receive feedback. The plan findings and recommendations were informed by stakeholder surveys, interviews, workshops, and meetings. Stakeholders included members of the host agencies’ leadership teams, administrators, facility managers, and others that were invited into the planning process by the host agencies. Outreach was conducted through digital platforms due to the travel and gathering limitations caused by the global COVID-19 pandemic.

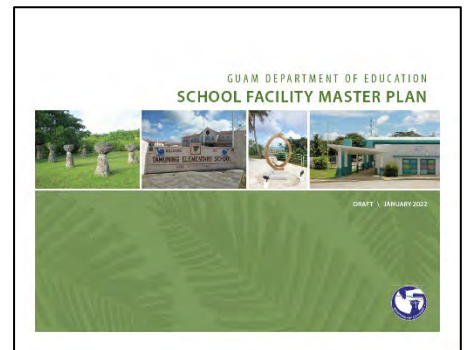


Figure 27 – Preventive Maintenance Plan

The FMP includes the results of analyses and related recommendations for:

- Facility standards
- Enrollment projections
- Capacity analysis
- Functional adequacy of existing facilities
- Prioritization framework for investments
- Cost estimates for repair and capital improvements
- Considerations for potential redevelopment options
- Redevelopment options

Territory-specific findings and recommendations are summarized for ASDOE and GDOE.

5.3.1 American Samoa

ASDOE has 29 public-school sites comprised of 6 secondary and 23 primary schools. Primary grade level schools are also referred to as elementary schools and include grades K-8 while secondary schools are referred to as high schools and include grades 9-12.

To support the master planning process, ASDOE identified a core group of participants compose primarily of ASDOE administrators. The planning process included stakeholder surveys, workshops, and meetings. Stakeholders included members of the ASDOE leadership team, administrators, facility managers, and educators. Outreach was conducted through digital platforms due to the travel and gathering limitations caused by the global COVID-19 pandemic.



Figure 28 – The three milestones and subtasks of the FMP planning effort

Population and Enrollment

The result of the enrollment straight line projection for future years 2021-2030 show a range of scenarios all with declining enrollment. Population change (2010-2020) and enrollment change (2013-2020) are shown in Figure 29. From the quarter projection used for analysis in this FMP is -0.8% per year. The capacity analysis paired with the enrollment projections provides a better picture of the ability for schools to either accommodate more students or flag facilities that may be underutilized.

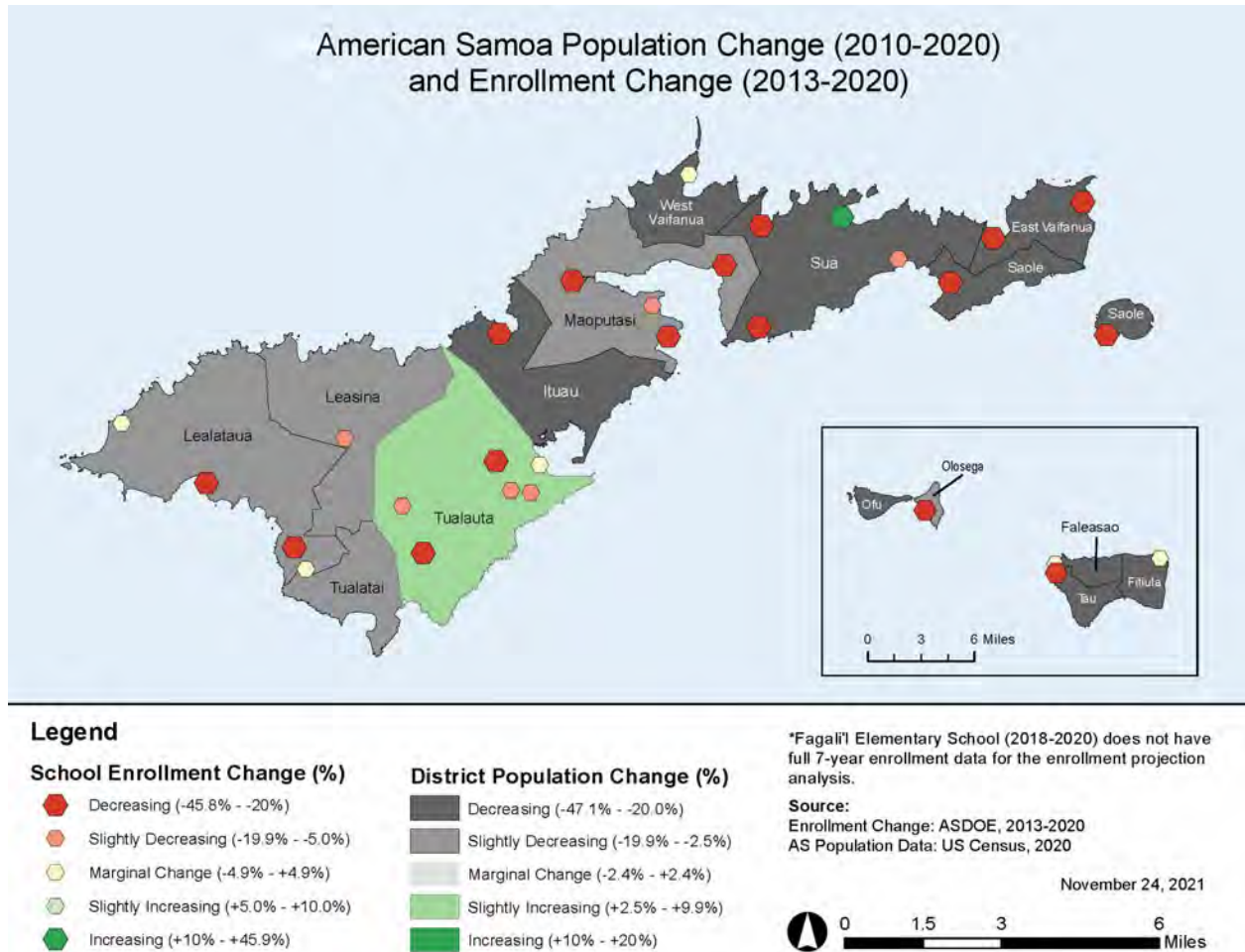


Figure 29 – Population change (2010-2020) and ASDOE public-school enrollment change (2013-2020)

Four primary and four secondary schools, mostly in the Tualauta area are expected to be overcapacity in 2030, and 11 elementary schools, mostly in eastern Tutuila and the Manu’a islands, are expected to be under capacity.

Estimated Cost

Territory-wide DM was estimated to total \$5.9M with 4% (\$0.2M) in the category of H/S. The total cost for new spaces and facilities at ASDOE schools is \$244M. These costs are summarized by school in Table 10.

Table 10 – Estimated ASDOE costs to address DM and construct needed facilities (\$M; 2022 dollars)

School	Total DM Cost	Total new space cost	Total Cost
A.P. Lutali ES	\$0.03	\$10.3	\$10.3
Afonotele ES	\$0.06	\$11.3	\$11.4
Alataua II ES	\$0.05	\$10.5	\$10.6
Alofau ES	\$0.35	\$11.3	\$11.7
Aua ES	\$0.03	\$8.9	\$9.0
Coleman ES	\$0.25	\$10.8	\$11.0
Fagail'i ES	\$0.003	\$10.0	\$10.0
Faga'itua HS	\$0.09	\$11.1	\$11.2
Faleasao ES	\$0.25	\$9.5	\$9.8
Fitiuta ES	\$0.29	\$9.7	\$10.0
Lauli'i ES	\$0.07	\$8.0	\$8.1
Le'atele ES	\$0.13	\$10.6	\$10.7
Leone HS	\$0.27	\$12.8	\$13.1
Leone Midkiff ES	\$0.18	\$10.0	\$10.2
Lupelele ES	\$0.12	\$10.3	\$10.4
Manu'a HS	\$0.54	\$11.9	\$12.4
Manulele ES	\$0.16	\$8.9	\$9.1
Masefau ES	\$0.03	\$10.2	\$10.2
Matafao ES	\$0.47	\$8.2	\$8.7
Matatula ES	\$0.40	\$11.3	\$11.7
Mt. Alava ES	\$0.07	\$10.5	\$10.6
Nu'uuli Polytech HS	\$0.31	\$19.8	\$20.1
Olomoana ES	\$0.14	\$9.3	\$9.4
Olosega ES	\$0.35	\$8.5	\$8.9
Pava'ia'i ES	\$0.24	\$10.5	\$10.7
Samoana HS	\$0.20	\$9.7	\$9.9
Siliaga ES	\$0.07	\$8.1	\$8.2
Tafuna ES	\$0.17	\$8.9	\$9.1
Tafuna HS	\$0.39	\$11.8	\$12.2
Total	\$5.7	\$302.7	\$308.4

ARP and CARES Act provide funding that can address remaining school repair needs and position ASDOE to focus on a healthy and proactive steady-state maintenance program.

Prioritization Framework

The purpose of the prioritization framework is to promote an equitable distribution of funds by using an objective method of ranking schools for renovation, replacement, and demolition funding. The results identified the top five priority schools as: Lupelele Elementary, Alofau Elementary, Pava'ia'i Elementary, Olomoana Elementary and Leone Midkiff Elementary Schools. These school priorities were also considered by region and the area with the greatest number of top ten priority schools is Central Tutuila. Priority ranking by school for ASDOE is shown in Figure 30.

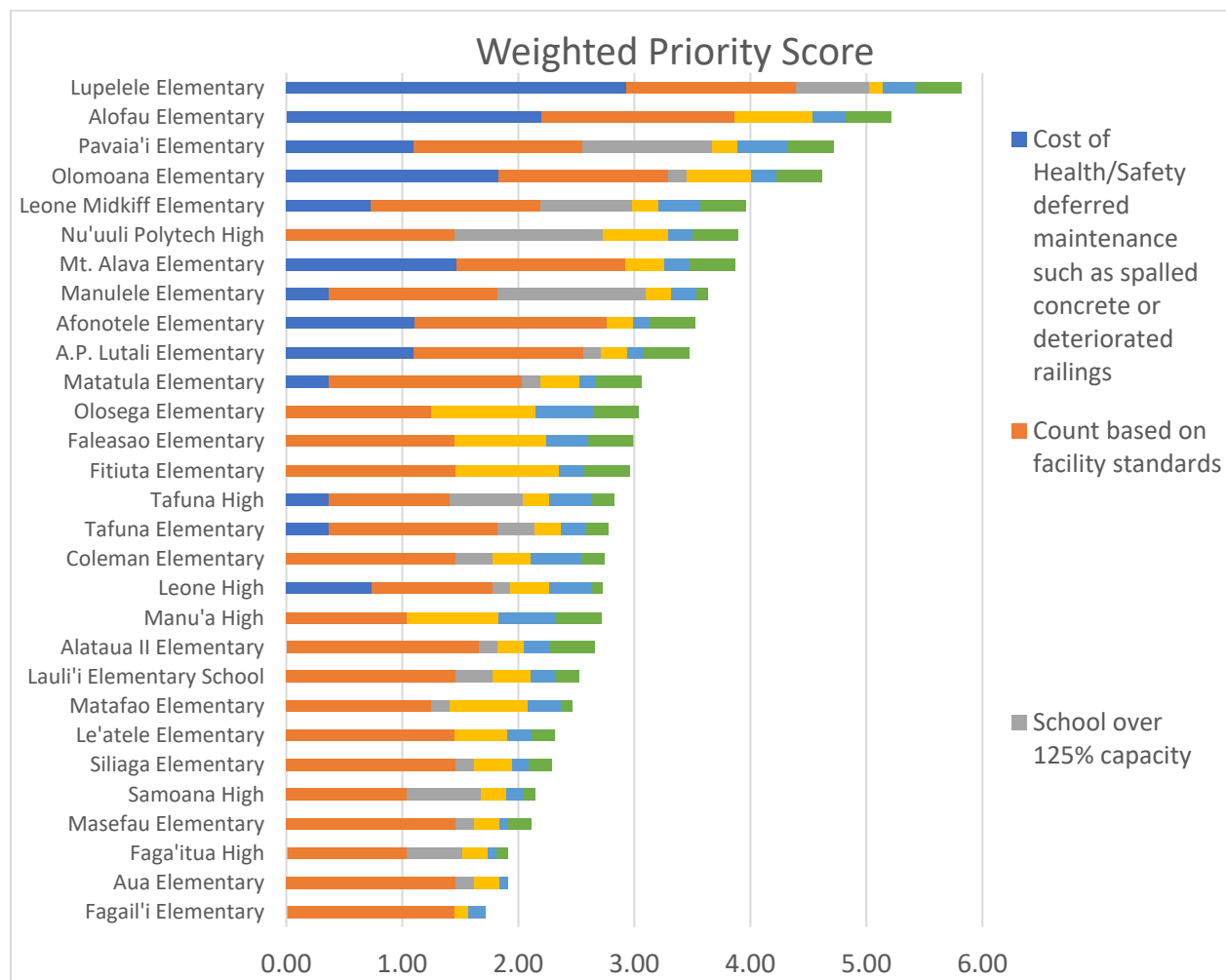


Figure 30 – Priority ranking by school

Next Steps

Further studies are recommended as part of next steps for school improvements.

- **Design enrollment**
 - Establish an acceptable range of enrollment for small and large schools. This will help establish a threshold as to when considerations should be made to construct a new building, a new school, or consolidate existing facilities.
- **New school site study**
 - Determine where new facilities could be sited in the future to alleviate areas of overcrowding and avoid natural hazards
- **School consolidation and closure considerations**
 - Look for opportunity to combine resources or work with the community to share resources. This can eliminate the need for ASDOE to invest in the maintenance and repair of underutilized facilities that could be repurposed for another organization.
- **Individual School Redevelopment**
 - Conduct a space utilization study to determine how spaces are being used and whether existing space can be used differently or if new space is needed. Especially consider potential areas for outdoor activities.
- **Safe routes to school**
 - Work with families, villages, and public safety agencies, to determine safety enhancements that could facilitate students safely getting to/from school

5.3.2 Guam

GDOE has 40 operational public-school sites (six high schools, eight middle schools, and 26 elementary schools). Six of the schools are leased schools (e.g., designed, financed, built, and maintained by a third party). GDOE is responsible for facility management at 34 of the schools. The total inventory at the 34 GDOE-maintained schools is over 3.3 million square feet (SF) with an estimated replacement value of \$817M.

The findings and recommendations of the plan were informed by stakeholder surveys, interviews, workshops, and meetings. Stakeholders included members of the GDOE leadership team, administrators, facility managers, educators, students, and the broader GDOE network including elected officials, GovGuam department heads, and vital support from the Guam Education Board. Outreach was conducted through digital platforms due to the travel and gathering limitations caused by the global COVID-19 pandemic.

Population and Enrollment

The result of the enrollment straight line projection shows a loss of 3,850 students from GDOE schools from 2021-2030 or an average decline of 1.4% per year. The greatest enrollment decline is in the west and the smallest decline is in the south. Capacity analysis for the FMP, paired with the enrollment

projections, shows that changes in school enrollments do not correlate directly with village population changes. Guam population and public-school enrollment change from 2011 to 2021 is shown in Figure 31.

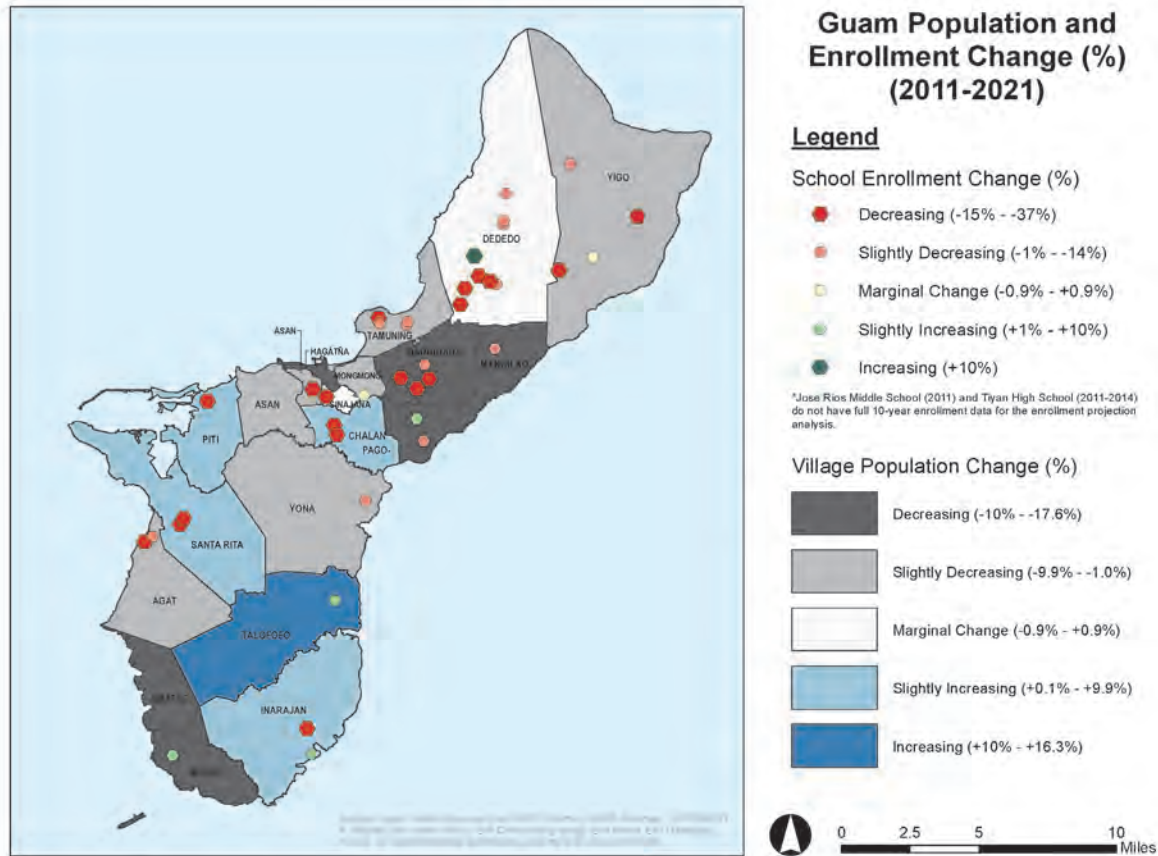


Figure 31 – Guam population and public-school enrollment change (2011-2021)

Estimated Cost

Territory-wide DM was estimated to total \$110M with 65% (\$70M) in the category of H/S. Total cost of needed new spaces is estimated at \$140M for the schools that GDOE maintains. The total cost for new spaces and facilities at ASDOE schools is \$244M. These costs are summarized by school in Table 11.

Table 11 – Estimated GDOE costs to address DM and construct needed facilities (\$M; 2022 dollars)

School	Total DM Cost	Total new space cost	Total Cost
Agueda Johnston MS	\$4.1	\$9.3	\$13.4
Astumbo ES	\$1.9	\$2.1	\$4.0
C.L.Taitano ES	\$2.0	\$2.2	\$4.2
Henry Price ES	\$4.3	\$2.2	\$6.5
Carbullido ES	\$2.8	\$2.2	\$5.0
Chief Brodie ES	\$2.7	\$2.2	\$4.9

School	Total DM Cost	Total new space cost	Total Cost
D.L Perez ES	\$4.0	\$2.1	\$6.1
FB Leon Guererro MS	\$8.2	\$11.7	\$19.9
Finegayan ES	\$3.3	\$2.2	\$5.5
George Washington HS	\$5.2	\$10.2	\$15.4
Agana Heights ES	\$1.6	\$2.1	\$3.7
Inarajan ES	\$1.5	\$2.1	\$3.6
Inarajan MS	\$2.8	\$9.3	12.1
J.Q. San Miguel ES	\$3.2	\$2.1	\$5.3
Jose Rios MS	\$1.3	\$10.9	\$12.2
JM Guererro ES	\$3.2	\$2.1	\$5.3
L.P. Untalan MS	\$1.3	\$9.6	\$10.9
LBJ ES	\$1.1	\$2.2	\$3.3
Marcial Sablan ES	\$1.8	\$2.1	\$3.9
M.U. Lujan ES	\$0.8	\$2.1	\$2.9
Machanano ES	\$1.7	\$2.2	\$3.9
Maria A. Ulloa ES	\$1.6	\$2.2	\$3.8
Merizo martyrs ES	\$2.8	\$2.2	\$5.0
Oceanview MS	\$2.5	\$10.3	\$12.8
Ordot Chalan Pago	\$1.4	\$2.1	\$3.5
P.C. Lujan ES	\$2.9	\$2.1	\$5.0
Simon Sanchez HS	\$7.4	\$8.6	\$16.0
Southern HS	\$13.1	\$2.1	\$15.2
Talafofo ES	\$1.6	\$2.1	\$3.7
Tamuning ES	\$4.2	\$2.1	\$6.3
Truman ES	\$1.6	\$2.1	\$3.7
Upi ES	\$3.2	\$2.1	\$5.3
Vicente Benavente MS	\$3.7	\$10.3	\$14.0
Wettengel ES	\$2.6	\$2.1	\$4.7
Total	\$110M	\$140M	\$250M

ARP and CARES Act provide an unprecedented opportunity to address school repair needs and position GDOE to focus on a healthy and proactive steady-state maintenance program.

Prioritization

The purpose of the prioritization framework is to promote an equitable distribution of funds by using an objective method of ranking schools for renovation, replacement, and demolition funding. The results identified the top five priority schools as: F.B. Leon Guerrero MS, Vicente S.A. Benavente MS, Inarajan

MS, Juan M. Guerrero ES, and Merizo Martyrs Memorial ES. These school priorities were also considered by region and the area with the greatest number of top ten priority schools is the Northern Region. Priority ranking by school for GDOE is shown in Figure 32.

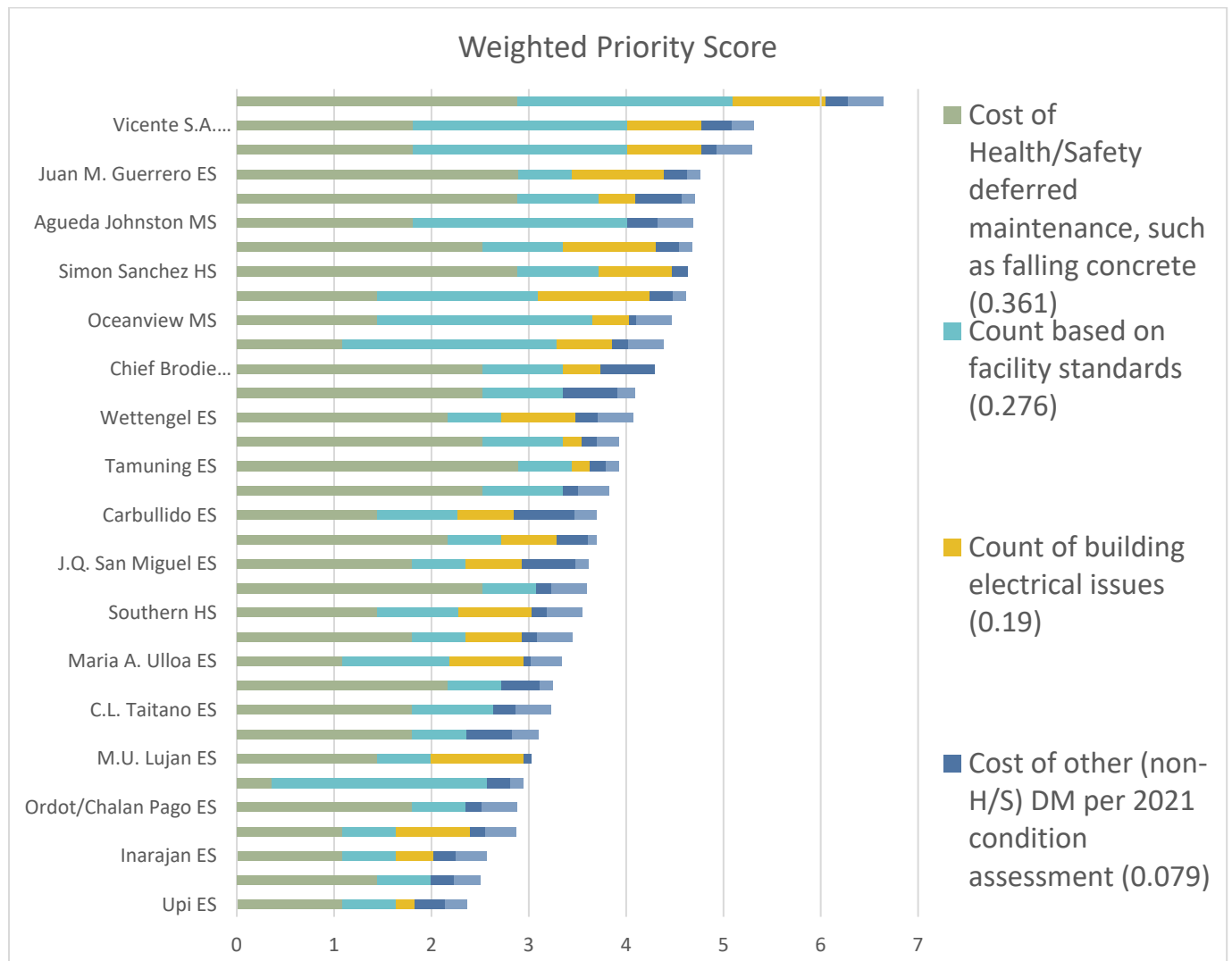


Figure 32 – Priority ranking by school for GDOE

Next Steps

Further studies are recommended as part of next steps for school improvements.

- **PK-8 Schools Feasibility Study**
 - to explore the viability of a PK-8 school model at select schools, where deemed appropriate
- **Central MS Site Selection**
 - to select a location for a new central MS

- **School Redevelopment plans** – these should include:
 - Space utilization and programming study
 - Architectural and engineering analysis, school administrator surveys, stakeholder charrettes to identify technical issues and receive input and guidance from educators and administrators, to inform redevelopment options and identify alternatives
 - Individual site improvement plans including renovation and new development
- **Traffic assessments**
 - to improve on site traffic circulation, reduce localized congestion associated with school pickup/drop-off and improving the ability for students to utilize alternative modes of travel such as walking or bicycling.

5.4 O&M Compilation

As a component of the final year of the ABCs initiative, documents related to Phase 3 Year 4 and 5 efforts for ASDOE, GDOE, and VIDE were compiled for the respective host agency’s reference and use in continuing DMRP execution and organizational sustainability building. This compilation, referred to as the O&M Manual, includes:

1. Preventive Maintenance Plan:
 - a. Job Plans
 - b. Work Plan
 - c. Repair Work Hours
 - d. Spare Parts and Supply Lists
2. Construction Plans and Specifications
 - a. DMRP Project Awards Tracker
 - b. DMRP project procurement and contract documents
3. As-Built Construction Documents
4. Updated site maps for needed grounds improvements
5. Electrical One-Line Diagrams
6. Equipment Maintenance Manual and Warranty Information

This compendium of work products was prepared in close coordination with host-agency leadership and facility managers.

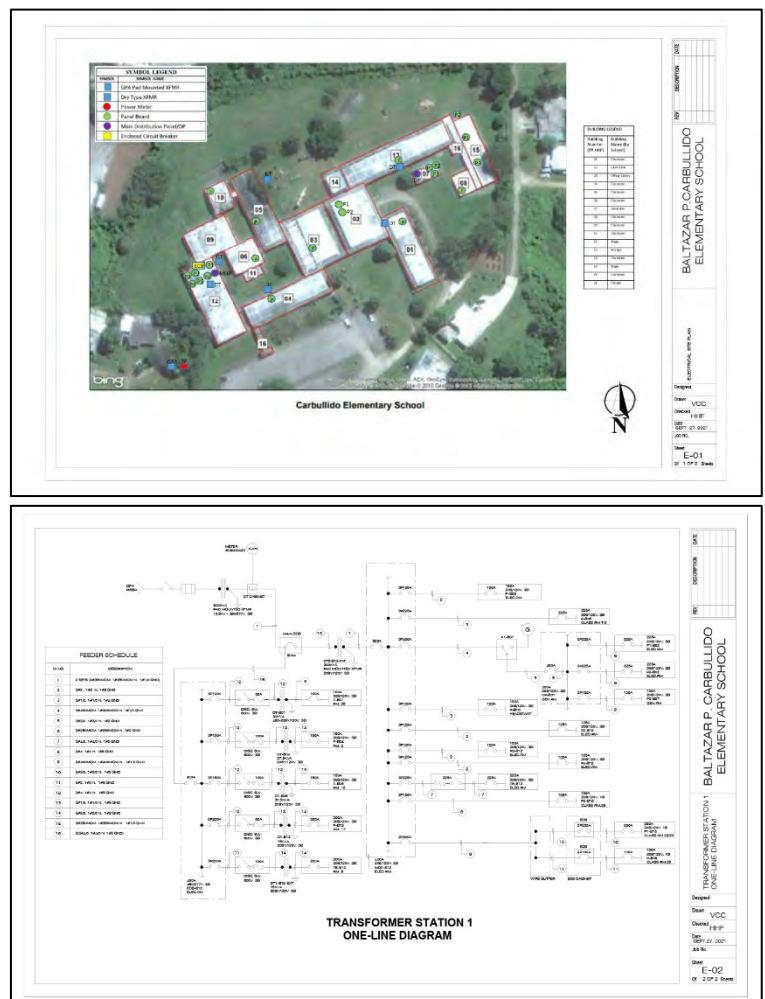


Figure 33 – Example one-line diagrams

6 Lessons Learned

The Insular ABCs Initiative was an ambitious program with two overarching goals associated with US DOI's strategic plan goal of improving physical conditions of territorial schools: 1) to reduce the highest priority DM in the territories and 2) build facility management organizational capacity. The territories responded differently to efforts related to building organizational capacity. The second goal was off-putting to ASDOE School Maintenance, the ASDOE facility manager believed the main issue was lack of funding (for appropriate staffing and construction budgets). Chronic underfunding is a serious issue that is difficult to change significantly because of economic challenges (in all territories) and the needs of other agencies. A consistent drive of the ABCs Initiative was to explore ways to optimize the many processes related to facility management. GDOE and VIDE were receptive to assistance and engaged with interest in all tasks but were not able to move ahead with all facets. CNMI focused on building in-house confidence to research and develop capabilities on their own; unfortunately, the progress made was affected by and possibly lost because of the impacts and response and recovery efforts of Typhoon Yutu and the associated disaster declaration. Fourteen aspects of the ABCs program are reviewed in this section including:

1. Local staff repair project scoping and oversight support
2. Communities of practice
3. Agency partners
4. Energy conservation measures
5. Engineering team contributions
6. Procurement approaches employed by the local teams
7. Local procurement or project delivery issues
8. RECs/NEPA framework
9. Workplan prioritization process
10. Trades training
11. Impact of unplanned events (cyclones and the pandemic) on deferred maintenance
12. Assistance with grant requests
13. EAMS software selection, carrying costs and training
14. Root causes

Lessons learned for each of these areas, and thoughts for the host agencies and OIA moving forward are provided for noteworthy host-agency experiences. It is important to recognize the support provided by school district leadership and facility managers. The professional working relationships that developed between the local ABCs staff and the organizations they served, and these relationships were essential. The long-term stability that the local ABCs program managers provided was another critical factor in moving the ABCs Initiative forward.

6.1 Local staff repair project scoping and oversight support

Having additional hands and minds creating scopes and moving repair projects through procurement, construction and close out was essential to the success of the DMRP effort and was well received in each territory. Referring to one of the core concepts presented in Phase 1, a large investment over five

or six years, as an addition to regular funding, is essential to reducing DM and getting the respective organization to a steady state. This initial increase is represented by the red line in Figure 34, and the effect on baseline funding is shown by the blue line.

While it is important to note that total maintenance funding indicated in Figure 34 is higher after the five or six years, to preserve steady-state conditions, it is also important to consider the resources (e.g., staff time and expertise) needed to utilize the additional DM reduction funds. Existing facility management staff is tasked with regular maintenance, investment planning, budget requests and local budget hearings, procurement, construction oversight, contractor management, project closeout, and the never-ending onslaught of trouble calls, among other tasks. Adding funding without additional personnel to support project delivery would have overwhelmed the host agency’s ability to manage the workload for both facility managers and for procurement. This may be a concern for execution of work in utilizing ARP and CARES Act funds. Procurement staffing in the territories includes in-house personnel, external procurement offices, and Governor or Office of Management and Budget oversight for large projects. Capacity of the procurement offices should also be considered and is discussed further in Section 6.4.

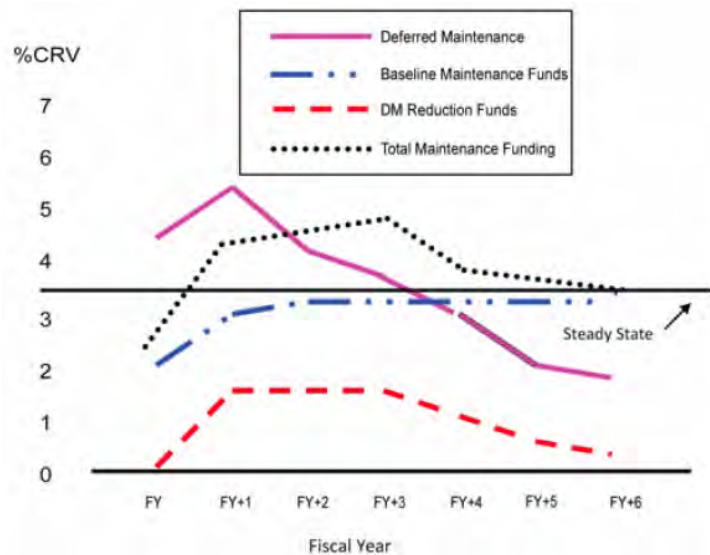


Figure 34 – DM Reduction Funding Profile (NASA, 2008)

The ABCs PMs and CSs worked with host-agency counterparts in creating work scopes for DMRP projects. The extent of scoping varied depending on the scale and complexity of the project and scopes, construction details, specifications, and warranty requirements generated by the local ABCs staff for IFBs and RFPs were used by host-agency facility managers as templates for other work. Examples include air conditioner replacement specifications, covered walkway design, and roofing material, application, and warranty specifications. These contributions from the ABCs Initiative provide lasting value to host-agency facility management efforts. These actions indicate that the ABCs-introduced facility management improvements have been institutionalized but there is always risk of knowledge loss, especially during staff and administrator changes.

The support provided by the local ABCs teams for executing DMRP work was temporary, as depicted by the temporary maintenance funding increase shown in Figure 34. Regardless, the tools, informational resources, DMRP scope templates, and construction management information passed on to the host agencies by the ABCs team (Honolulu office and local staff) have the potential to support long term facility management improvements. Points made in the Organization Sustainability Plan and Preventive Maintenance Plan, as well as the tools provided by EAMS, offer valuable resources and guidance that can help the host agencies plan for information transfer and staff transition planning.

6.2 Communities of Practice

When PMs were first deployed to the territories, the Honolulu office worked to create a collaborative environment with the embedded PMs and provide opportunities to share experiences and resources to build capabilities amongst the local teams, to establish communities of practice. Monthly calls were held with all PMs early on and they quickly became comfortable contacting each other when questions arose or with lessons learned. The monthly all-PM calls became sporadic and were eventually discontinued as the PMs became busy



Figure 35 - GDOE covered walkway repair

with executing DM projects and due to inevitable personality differences. Facilitated by the Honolulu office, the PMs shared work scopes, material specifications, and design details (e.g., roofing repair, AC replacement, fire protection improvements, covered walkways). The Honolulu PM regularly referred PMs to one another where specific expertise was needed. More leadership from the Honolulu office may have increased the extent to which PMs collaborated, regardless, the PMs became comfortable calling each other to share thoughts. The CNMI PM was particularly skilled with mechanical equipment (e.g., pumps) and specification testing for fluid applied roofing projects. The Guam PM developed covered walkway specifications that informed related work in CNMI and USVI. The USVI PM established a thorough IFB and engineer's estimate template and architectural specifications that set the bar for the other territories. And the American Samoa PM assisted all territories with electrical and AC scopes and specifications and champion for EAMS utilization and training for host agencies and backed up PMs in Guam and USVI with EAMS build out and transition to host agencies.

6.3 Agency Partners

An early goal in Phase 3 was to work with other agencies to combine resources and maximize investments. The rubric was that it takes a village and that there are overlapping government interests in the public schools that would benefit from a shared perspective and partnerships. Numerous meetings were held with local emergency management agencies, utility providers, renewable energy committees, US Department of Agriculture program representatives, Post-Secondary CTE program administrators (workforce training), and others. There appeared to be promising areas of mutual interest with the initial round of overtures. For example, emergent management agencies were interested in developing and sharing school facilities data for disaster management purposes and investments in hardening school building for emergency shelters. Key staff turnover and natural disaster events frustrated the effort. USDA Rural Development supports school cafeteria funding and provides low costs loans that may have bootstrapped some of the early DM work – or provide temporary gap funds to leverage larger projects.

The Honolulu Office tried to build relationships but ultimately realized that without sister federal agency support, or local Governor support, it was not possible to translate the “good idea” into an actual interservice agreement. An early initiative was to build bridges with energy service companies (ESCOs) community involved in territory projects to underwrite energy conservation efforts common in many US based school districts (Guam and USVI had early experiences and lessons learned that were applied to broaden the search for potential partners). The level of interest in the local energy offices tapered over time and the several natural disaster incidents shut down continued discussion. The initiatives were worthy, but a more sustained effort was needed to land some prototype projects. Aligning efforts, objectives, and funding also proved to be unpracticable during the ABCs Initiative. Regardless, this approach has the potential for success and many opportunities exist such as implementation of energy conservation measures or kitchen and cafeteria upgrades. Recruiting and coordinating with potential partner agencies requires a sustained effort.

6.4 Energy Conservation Measures

HHF invested many hours in preparing for, conducting, and documenting meetings with representatives from local and federal agencies that could help support ECM-related actions at the territorial public schools. Efforts were made to set up ESPCs and partner with the local power authorities and energy offices, but HHF was unable to advance ECM-related projects that would help the schools. Companies that were positioned to support ESPCs were interested but pointed out the financial risk issues that territorial agencies have. Local agencies acknowledged shared goals but were unable to commit resources to school improvement efforts.

Leveraging the ECM funding process would offset the territories’ chronic lack of underwriting capital, make them more competitive in the international ESPC market, build self-sufficiency and bootstrap DM backlog reduction efforts. It would also assist the host agencies to execute projects and potentially enable them to partner with related agencies, pair resources, and build momentum in advancing sustainability at the schools. Facility master plans for American Samoa and Guam identified sustainability as a core pillar with the goal that “facilities incorporate sustainable and environmental best practices to reduce impacts and save money”. Progress toward this goal can be made by applying sustainable facility design standards to projects, capitalizing on the lifecycle savings of renewable energy sources, and using sustainability processes to support curriculum and learning opportunities. Sustainable school design and help the school districts provide higher quality learning environments, better learning experiences, and ultimately higher student performance through these investments.

6.5 Engineering team contributions

Similar to local ABCs staff contributions, HHF’s SME team support for scope and design preparation efforts was very helpful for more complex DM projects.

The electrical engineers reviewed and provided recommendations for several large HVAC replacement projects, particularly for work in USVI, and assisted in establishing the data collection method and reviewing diagrams for preparation of the electrical one-line schematics for Guam, USVI and American Samoa.

The team architects assisted with scope development for many projects in USVI including specification recommendations for roofing and exterior envelope repairs and replacements for covered walkways, doors, and windows.

The structural engineers provide design load calculations for roof structure replacement, assistance with specifications for covered walkways, and second floor concrete walkway and beam repair, as well as methods and specification recommendations for spall repair.



Figure 36 – Column repair at GDOE's Southern High School

Civil engineers provided detailed recommendations for drill pad replacement in USVI and specifications and cost estimates for the creation of new playgrounds for elementary schools.

This was a difficult service to scope because host agency priorities shifted based on circumstances and ongoing reevaluation of alternatives. The flexibility of the SMEs in providing ad hoc support as needed to support evolving priorities extended DMRP capabilities.

6.6 Procurement approaches employed by the local ABC teams

Local ABCs PMs used their professional judgment, and advice from host agency counterparts, in considering project priorities, procurement constraints, and local contractor capacity for determining the most effective way to package work. Each territory has only a few contractors that can handle projects over a million dollars so competition at that level is low. The risk of litigation during procurement is also higher for projects at this level (e.g., Guam). No lawsuits were experienced during the ABCs Initiative, largely due to careful planning by local ABCs PMs and coordination with host agency facility and procurement managers. Regardless of these risks and more arduous procurement processes, procuring larger projects was required because of work scopes in many cases (e.g., large canopy and HVAC replacement projects). These projects experienced many delays with in-house procurement, external procurement offices, and Office of Management and Budget/Attorney General/Governor office (or similar) review and approvals. Unless it was necessary or advantageous to move high-cost projects, the PMs (and host agency counterparts) preferred to keep projects smaller to reduce procurement time and increase the number of local contractors available to compete for the work.

When the DMRP began, the American Samoa PM's strategy was to start with a few small projects to build momentum and learn more about the contractors and the procurement process with the intention of moving to larger scale work as the program progressed. It quickly became evident that larger scale work would be too problematic and instead ended up moving more than 100 small projects (along with

a few around \$300,000) at 23 of 29 schools (about 79%). This proved to be a successful approach for American Samoa.

The CNMI PM initially intended on packaging a few large repair and renovation projects. One example of this was the design contract for high priority H/S fire protection improvements for all schools. Designs were completed for all schools (Exhibit A), but costs for the improvements ultimately far exceeded ABCs or PSS budgets. The basic scoping and cost estimates were sound, so a decision was made to break the work into smaller packages following common specifications (Unfortunately, Typhoon Yutu changed the host agency priorities and postponed the fire protection improvement initiative). During the long procurement and design process for fire protection upgrades the PM executed more than 100 small scope maintenance projects at 19 of 20 schools (95%).

Guam and USVI both had several high-cost projects because of the nature of the work required, and the higher construction costs in those territories. Both territories had projects that were held up by procurement and contracting delays that had to be turned over to the host agency because they couldn't be completed, or even contracted in some cases, by the end of the program (five in Guam and seven in USVI). The Guam PM was able to conduct work at all schools because of a district-wide fire alarm repair project and 15 of 34 schools for other maintenance projects (44%). The USVI PM conducted work at 16 of 29 schools (55%; five schools closed because of damage from the 2017 hurricanes, including four schools that had completed or underway DMRP projects). Guam and USVI were successful in moving both large and small projects.

6.7 Local procurement or project delivery issues

Host agencies cautioned the local ABCs teams about procurement delays at the start of Phase 3 so the local teams could plan project execution accordingly. Local ABCs staff were aware of the challenges and did their best to navigate them throughout the DMRP. Sections 6.4.1 through 6.4.4 document anecdotal information provided by local ABCs PMs.

6.7.1 American Samoa

Procurement and project delivery issues in American Samoa included delays in publishing Invitations for Bids (IFBs), generating contracts, and final payments for project closeout. Inconsistencies between the policies of various agencies and inefficiencies in processing project documents could be examined further to identify potential areas of improvement.

One issue was the low limit for sole-source and in-house contracting (\$2,500 and \$10,000 respectively). The ABCs PM for American Samoa noted sole-source limits for the American Samoa Power Authority are \$1M, and that the Governor's Office regularly sole-sources contracts for higher amounts, some well above \$1M.

Project procurement experienced delays first in getting approvals/signatures at the Budget Office, where staff would confirm that grant totals were adequate. These delays added weeks to the process and were largely due to inefficient processes, staff workloads, and competing priorities. Once

procurement materials cleared these steps the Procurement Office moved effectively with publishing solicitations.

Inconsistencies were also experienced when the ABCs team and School Maintenance staff tried to procure work internally (under \$10,000). Contractor selections required Procurement Office approval for contracting and on several occasions refused to follow the ABCs PM's recommended selection even though the selection was made following the Procurement Office's policies. The ABCs PM also reported that the Procurement Office selected contractors for ABCs work that lacked experience and were undercapitalized, which lead to long delays and change orders during construction.

Contracting also experienced delays in getting approvals from the Department of Public Works (DPW) and the Budget Office where paperwork could get held up for one to two months. The ABCs team also experienced problems with the Budget Office losing payment applications which delayed contractor payments and project closeout. DPW used a "paper runner" to ensure that their documents were getting adequate attention. This approach could help the School Maintenance Office and would require staff to dedicate time to engage with Budget Office staff.

Communication between American Samoa Government (ASG)/DPW and the School Maintenance office was sometimes poor and resulted in the demolition of buildings that were newly renovated in a few instances. The FMP will ideally help start a process of improved planning for coordinated facility management.

There may be opportunities to improve the processes and policies that guide the steps in project delivery. Oversight, accountability, and how goals and priorities are communicated could help.

6.7.2 CNMI

The following captures the PSS procurement issues that were recorded in the Organizational Sustainability Plan before CNMI left the ABCs program (circa 2019).

The high number of procurement documents going through PSS and the Department of Finance causes project delays. To address this, the ABCs PM worked with PSS Procurement to raise the limit, from \$10,000 to \$30,000, for projects that could be procured with a purchase order instead of using the more time consuming IFB/RFP process that is conducted by the Department of Finance. This change allowed the Facilities Development and Management office (FDM) and ABCs team to execute more work through the internal procurement process. The FDM/ABCs team was also able to solicit quotes and select contractors directly for work under \$30,000 to expedite procurement for a higher number of repair projects, but the bid process is still used in most cases to ensure a fair distribution of work to available contractors. For comparison, Guam DOE's in-house purchase limit was historically \$50,000, and was recently raised to \$100,000K; this can serve as a benchmark.

Procurement requires many reviews and signatures throughout the process, requiring that key personnel be available and responsive or else the project cannot move forward. Delays decreased between 2016 and 2018, however, issues still exist where delays result from one person being out of the

office for an extended period (e.g., one week or more), without identifying a replacement that could address the needed action. There are also instances where staff are present but may have other priorities or otherwise cannot complete the needed action. A designee protocol (requiring qualified backup staff) should be put in place to ensure that procurement-related documents continue through the process if such hold ups occur. Follow up by an administrative assistant is also crucial for addressing instances in which documents are held up or misplaced. FDM could add a purchasing/procurement officer position, or add these duties to an existing position, to further reduce procurement time.

6.7.3 Guam

The GDOE Procurement Office is diligent in reviewing each project to ensure compliance with Guam procurement law, including small purchase contracts in addition to large government contracts even if several similarly scoped projects are being procured (i.e., there is no time savings for a templated approach). The GDOE Procurement Office typically avoids sole-source contracts, one example was the refusal to sole source a \$14,000 design project for the Southern HS covered walkways even though there was justification for selecting a certain contractor.

Projects under \$100,000 are procured by GDOE. Work over \$100,000 needs to be publicized and work over \$500,000 requires approval by the Attorney General and Governor. The local ABCs PM noted that GDOE can procure services inhouse up to \$250,000 with USDOE grants (and not have to follow the more stringent local requirements) and this could be considered for other grants that are available to GDOE.

In-house procurement can take at least 30 to 45 days due to a shortage of staff or staff capabilities. If a project requires approval from the Attorney General, then that adds at least two weeks and usually another 30 to 45 days from the time the solicitation leaves GDOE to the time it gets Governor's signature.

Delays with these steps held up DMRP work, especially due to understaffing at GDOE Procurement. Toward the end of DMRP efforts conducted as part of the ABCs Initiative, further delays were experienced due to issues with contractor bonding and permitting requirements, particularly problematic for Guam EPA permits required for site improvements. Permitting delays were upwards of two to three months and appear to have been exacerbated by disruptions of service caused by the Covid-19 pandemic. Permits may be required from the Bureau of Land Management, Guam EPA, Fire Department, DPW, Public Health (new requirement for all school related projects), SHPO/Parks and Recreation. Coordination with SHPO is being effectively managed with the RECs that were prepared for DMRP work.

Before contracts leave GDOE, there are sometimes issues with contractor procurement bonds; bonding company have put in place higher asset/financial standing requirements for contractors have (e.g., cash bonding) potentially because of perceived risk with mid-sized contractors. This may be related to labor issues that resulted from the Covid-19 pandemic.

Some delays were also experienced with project closeout due to agency reviews for occupancy permits; this added upwards of another 30 days to closeout. Project inspections were sometimes delayed due to school access issues which were exacerbated by the Covid-19 pandemic.

As with the other territories, many of these issues could be resolved with oversight and communicating goal and priorities; staffing limitations and workloads were also contributing factors.

6.7.4 USVI

The high number of procurement documents going through procurement contributed to delays with DMRP work. The ABCs team attempted to create, with VIDE, the Department of Property and Procurement and the Attorney General’s Office, a task order contracting vehicle for indefinite delivery indefinite quantity task orders (e.g., design, construction management) that could be scoped and negotiated on a task-by-task basis, instead of using the more time consuming IFB/RFP process. This was unsuccessful for DMRP work due to the number of agencies that needed to sign off but appears to be in place for post-hurricane recovery efforts.

The in-house procurement limit of \$50,000 should also be reconsidered as it is still relatively low (e.g., Guam DOE limit was historically \$50,000, and was recently raised to \$100,000). The potential for VIDE to let more work in-house should be balanced with VIDE Division of Procurement’s ability to handle this additional workload.

Projects over \$50,000 require many legal reviews and action steps and depend on key personnel being available and responsive to avoid project delays. Follow up by an administrative assistant is also crucial for addressing instances in which documents are held up or misplaced. VIDE could add a purchasing/procurement officer position, or add these duties to an existing position, to assist with moving school maintenance procurement. Regarding the high volume of work going through the VIDE Division of Procurement and DP&P, implementation of a task order contracting vehicle for M&R projects would help streamline project delivery for selected services. This would also allow for the selection of contractors based on qualifications and past performance (e.g., workmanship, and ability to complete work on time and within budget), instead of just price, if records are kept for past performance. Increasing the in-house procurement limit should be considered to minimize procurement delays. Again, Guam DOE’s in-house purchase limit was recently raised to \$100,000K; this can serve as a benchmark.

6.8 RECs/NEPA framework

DMRP project funding was set by an Authorization to Proceed (ATP) issued by OIA. ATP prerequisites included compliance with NEPA provisions and being an authorized Work Plan project. USACE supported the territories in satisfying NEPA compliance through a series of RECs.

RECs were prepared two categories of work:

- 1) repairs at buildings that would be less than 50 years old at the end of the DMRP
- 2) repairs at buildings that would be 50 years or older at the end of the program and work that included ground disturbance

Related agencies were consulted, e.g., local State Historic Preservation Offices and local and federal natural resource management agencies. In accordance with Executive Order 11988, Floodplain Management, the designated eight-step process was followed, including public notice seeking the public's involvement in the decision-making process with a public notice at the end of the process providing agency's findings and decision.

To streamline NEPA reviews for repair work at schools, it is recommended that the host agencies prepare exemptions lists in coordination with related agencies, that exempt specific types of action from the need to prepare an environmental assessment because the action will have minimal or no significant effect on the environment. This type of agreement would likely exclude work on listed (or eligible for listing) on the Federal or State registers of historic places, projects in statutorily defined areas (e.g., critical habitats, special management areas), major projects that warrant an Environmental Assessment with a Finding of No Significant Impact, or major projects that were never presented at a public meeting or without a program to encourage public input into the design or siting of the project.

The ability to create exemptions lists would need to be confirmed with local regulations and related agencies. Having this type of agreement in place would expedite the host agencies' ability to execute work when federal funds are used.

6.9 Workplan prioritization process

The workplan creation and prioritization process was introduced in Section 2.1 of this report and was primarily guided by the highest priority DM concerns (e.g., H/S DM) and Phase 2 condition ratings. Given the high DM totals, particularly in Guam and USVI, 34 priority levels were established to further explore the nature of the DM issues (e.g., differentiating between exposed electrical panels and exposed electrical receptacles), the construction material of the building (e.g., fire alarm repair at wooden or concrete buildings), and the extent of building enclosure issues (e.g., leaks that are creating mold or compromising utilities within a building) to refine the list of highest priority projects to fit within the annual DMRP budget totals.

This process also considered other repair needs within the buildings that were identified as having the most urgent repair needs to ensure that work was done holistically. Work plans were approved by the host agencies and OIA as a prerequisite for expenditure of DMRP funds to avoid preferential reallocations. Work plans were revised annually for the first few years of Phase 3 to account for changing conditions. Emergent additions to the work plans were created and approved by the host agencies and OIA and screened through the environmental review process to ensure that the most urgent needs were addressed.

Prioritization of repair projects was helpful for setting objectives, providing objective rationale and transparency for investments, and establishing consensus on the difficult choices that were made regarding what would and would not be addressed under the DMRP.

Workplan prioritization established an important framework for guiding DMRP investment. The GDOE and ASDOE FMPs addressed general improvement needs and added a geographic equity component. Geographic equity considered the level of investment schools experienced in the last ten years with federal stimulus funding such as the American Recovery and Reinvestment Act and the ABCs DMRP. These approaches provide examples that the host agencies can refer to and build on as they continue planning repairs and capital improvements.

6.10 Trades training

Host agency progress with maintenance staff training was reviewed in the ABCs Phase 3 Year 4 report. Training did not progress in Year 5 due to work loads, resource limitations, and issues that arose from the Covid-19 pandemic. American Samoa DPW demonstrated the greatest success with training 40 staff members over a three-semester period with a 100 percent completion



Figure 37 – PSS plumbing training with maintenance staff

rate. PSS FDM provided plumbing training (one of the Division’s greatest needs) to 20 staff. Training has not continued for either territory. While progress was made in American Samoa and CNMI, it is important for the host agencies (and OIA) to keep in mind that ongoing training is required. All territories have expressed the challenges of training staff and then those staff moving on to higher paying jobs, which could include finding work outside of the territory. The need for higher pay scales for maintenance staff is commonly cited but there are perceived economic constraints to supporting that shift. The Preventive Maintenance Plan (HHF, 2021) provides rationale for investing in ongoing proactive maintenance. The fact that there is regular turnover of maintenance staff is another reason why training should be ongoing.

GDOE was very interested in starting a training program, had identified dozens of staff that would be included, and even surveyed them to rate their current capabilities and identify the appropriate courses for them. Procurement again was the limiting factor and a solicitation for these services was not published because of concerns about the anticipated results of a competitive, lowest cost bid selection process. If GDOE were able to partner with a reliable provider, then GDOE could have a strong training program.

USVI was interested in pursuing online training during the pandemic and participated in demonstrations. VIDE’s many efforts to prepare schools for in-person learning, work on hurricane recovery actions, respond to ongoing trouble calls, and start planning and scoping for ARP and CARES Act projects made it impossible for VIDE to plan and schedule staff time for maintenance training.

Establishing continual training programs would be a valuable pursuit in all territories.

6.11 Impact of unplanned events (cyclones and the pandemic) on deferred maintenance

Several unplanned events impacted the ABCs initiative and local-staff ability to move forward with DMRP work. The most impactful events included:

- USVI (Irma 9/6/17 and Maria 9/20/17): two Category 5 hurricanes caused significant losses throughout the territory, including the closure of five schools that remain closed; \$3M in DMRP work was disrupted. The USVI St. Croix CS resigned because St. Croix DMRP work was put on hold for an extended period during the hurricane damage assessments.
- CNMI (Super-typhoon Yutu 10/25/18): caused extensive damage to southern Saipan including critical infrastructure, and the closure of two schools; \$3M in DMRP work disrupted. Typhoon Soudelor crossed over Saipan on 8/2/15 causing extensive damage to central Saipan, including several school campuses. In both cases, damage assessments and FEMA-related investigations and data calls consumed the available capacity of the PSS facility managers for many months at a time.
- American Samoa (Tropical Storm Gita February 9, 2018): caused distributed damage to schools at a level high enough for FEMA recovery funding but not to an extent that required the closure of schools.
- Covid-19 pandemic (direct impacts affected territories at different times starting in spring 2020 and continuing to present): disrupted virtually all activities around the world; travel restrictions, school closures and work-from-home requirements all disrupted ABCs Year 4 and 5 efforts including DMRP projects, EAMS roll out and training, and engaging host-agency contacts.

Project reprioritization for areas impacted by hurricanes/tropical storms was required but was delayed while the host agencies determined the extent of repairs that would be addressed by FEMA and what repairs would be addressed with DMRP funds. Local ABCs staff clarified projects that would not conflict with FEMA assessments and school district actions to address storm damage. These unplanned events delayed EAMS rollout in different ways in each territory. In USVI, VIDE contacts were focused on recovery activities in the months following the 2017 hurricanes such as the creation of temporary facilities and other steps required to prepare facilities restarting classes. The super typhoon in CNMI caused DMRP funds to be redirected to other CNMI recovery priorities and ultimately led to the closure of the ABCs program there. Covid-19 had far-reaching impacts in USVI and Guam, including closure of schools, work from home that severely limited communications with and ABCs-related actions of host-agency contacts (e.g., procurement staff), shipping delays, material limitations, higher construction costs, travel restrictions that disrupted condition assessments, and general delays to all ABCs efforts. The school improvement funding that resulted from the pandemic (e.g., ESF, ARP and CARES Act funds) provides the host agencies with singular opportunities to improve the conditions of their schools.

6.12 Assistance with grant requests

Host agency facility managers are strained and limited in their ability to carefully prepare forward looking grant requests. Noting priority preference for certain actions in grant announcements could help; examples that could be referenced include:

- Replacing computers (desktop or laptop) or purchasing tablets to ensure that office and field staff have the capability to use EAMS and other common business software
- Support for EAMS carrying costs while the host agency adjusts to making this a regular part of their operations and potentially EAMS database review to ensure that location and asset data entry are kept current, and that service requests and work orders are being managed effectively
- Reliable internet connections, preferable ethernet connections for offices and adequate Wi-Fi routers at schools to support student learning and field staff use of web-based tools
- Funding to include maintenance in contracted services (e.g., for AC or fire alarm installation); it is important to note that this will also require host-agency staff time to create and enforce a maintenance schedule to maintain accountability which will be challenging

6.13 EAMS software selection, carrying costs and training

Several leading facility management software systems were evaluated at the end of Phase 2 (circa 2013) to clarify which system would be most effective in helping the host agencies catalog facilities data and manage maintenance and repair information. Capabilities, usership and user interface, versatility, and cost were all important factors in the selection process.

Maximo was found to have the highest capability and flexibility in deployment and carrying costs. The National Park Service's experience with Maximo, and particularly the creation of the DST to justify budget requests, contributed to the selection of Maximo for the system and Clango as the IT developer.

Costs incurred by host agencies were minimized by OIA during the ABCs Initiative and the ABCs team worked to keep costs to a minimum for the host agencies during the transition of EAMS ownership and responsibility from HHF to the host agencies. Near the end of the program, it became clear that the effort to minimize costs to the host agencies and the delay in adopting the programs by the host agencies, approached the point at which vendors began to lose business interest in supporting the host agencies. If the host agencies continue using Maximo, then further exploration of IT support options and potentially additional funding for IT support may be needed. HHF ensured that the host agencies were aware of potential IT support options well in advance of the program wind down.

Several rounds of EAMS training were conducted in each territory to the systemwide user groups (e.g., leaders, managers, data input technicians, school-based service request initiators, agency IT staff, etc.). The EAMS system was due to be transferred to the host agencies in the fall of 2021 in tandem with the termination of the ABCs EAMS Coordinator (EC) positions in each territory. Unanticipated agency delays in securing equipment and vendor support agreements (exacerbated in AS with the transfer of school maintenance functions, including EAMS from DPW to DOE) took much longer than anticipated. Local staff turnover required multiple rounds of training and the extended turnover timeframe extended that

training responsibility. Turnover of IT systems like EAMS are complex procedures and require strong senior leadership support under the best of conditions. As noted in future actions below, the successful implementation of EAMS and its ability to transform facilities management functions, will largely depend on the continued support of senior leadership and its commitment to data driven decision making.

6.14 Root causes

Phase 1 of the ABCs Initiative quickly found that facility condition concerns were the result of underlying issues such as facility age, design limitations, use of inappropriate materials, lack of standardization in material and equipment selections (that complicate regular maintenance and repair), understaffing, rapid staff turnover and associated loss of institutional knowledge, lack of facility inventory data and information management systems, and inconsistent and undedicated maintenance funding streams. Opportunities to improve facility management practices were captured and guided subsequent ABCs Initiative efforts. Future evaluation of conditions and root causes could help gauge the extent to which facility managers feel secure in the various aspects of their work.

7 Conclusion

The phases of the ABCs initiative provided a rational approach to clarifying needs and stepping through an adaptive strategy to meet those needs. The successes and challenges that the host agencies experienced during the ABCs Initiative are discussed in Sections 5 and 6, and select successes and challenges are summarized in Table 12.

Table 12 – Successes and challenges experienced by the host agencies during the ABCs Initiative

ABCs Successes	Ongoing Challenges
Local ABCs staff: the experience and capabilities were critical in moving work forward without overburdening the host agencies (that were overwhelmed with ongoing duties); this support was well received in each territory.	Procurement for the host agencies and territories in general: in-house procurement limits should be no less than \$100,000 to mirror those of GDOE; scope templates help those writing scopes, but still get held up in legal reviews, templates provided by reviewers could be helpful.
SME support for scope and design preparation: highly valuable for complex DM projects and really extended DMRP capabilities; flexibility of this ad hoc support may be difficult to replicate.	Lapsing funds: due to various procurement challenges and resource constraints that limit facility managers’ time to dedicate to project delivery, facilitating time extensions for grant funds is very helpful.
\$1M per year dedicated to DM reduction: the set asides were very helpful to the host agencies and facilitated repair work at most of the schools	Despite the \$1M annual set aside, the reinvestment was not sufficient to reverse the growth in DM backlog. Assistance with grant

ABCs Successes	Ongoing Challenges
<p>throughout the territories (USVI at 55%, American Samoa at 79%, CNMI 95%, and Guam 100%); continuing to push Governors and host-agencies to dedicate funds for DM reduction would provide some stability and relief to facility managers.</p>	<p>requests: facility managers in the territories are strained; assistance with grant requests could help (e.g., maintenance contracts as a part of construction costs); ensuring facility management offices have adequate equipment is also important (e.g., computers and internet connections in American Samoa); support with EAMS carrying costs may also be needed.</p>
<p>Facility inventories, databases, and reporting: creation of the first ever facility inventories brought a higher level of awareness; condition assessments and establishment of industry leading facility management software with simple user interface and reasonable carrying costs has the potential to bring efficiencies to workflows and empirical justification to budget requests; these tools have revolutionized facility management in the territories.</p>	<p>Trades training: ongoing programs in all territories would help build capabilities of existing maintenance staff and address issues of staff turnover; assistance is needed to establish these programs.</p>
<p>The creation of preventive maintenance plans was well supported by host agency counterparts and these established clear steps for contracted and in-house tasks.</p>	<p>Implementation of ECMs and the preventive maintenance plan is slow if not hindered because of inertia and host/related-agency resource limitations, including funding and the time that people in key positions have to dedicate to various priorities.</p>

Covered in the OSPs (HHF, 2017) and explored further in the Preventive Maintenance Plans (HHF, 2021), longer-term institutional support needs such as succession planning, training, and stabilizing budgets will continue to be challenges. Succession planning requires a stable and reliable workforce that is difficult to maintain in an underfunded, high stress environment. Training programs can help build capabilities and identify staff that have potential to take on management roles. Stabilizing maintenance budgets can help stabilize workloads and potentially improve pay scales, both of which can contribute to reductions in staff turnover and the establishment of more sustainable maintenance offices.

Future actions that should be pursued to continue making progress toward OIA’s strategic goals include:

FMP implementation

- Redevelopment options
- Maintenance funding
- School modernization/redevelopment plans
- Enrollment projections/ capacity updates

Organizational Sustainability

- EAMS training and support
- Workforce training programs and support
- Update energy audits
- Sustainable design goals (criteria for public infrastructure/schools)
- Interagency partnerships
- Risk assessment and guidance— preparing schools for climate change
- OSP progress update

DM Reduction

- Reestablish contact with CNMI PSS
- Periodic condition assessments/DM project reprioritization; Indoor Environmental Quality and functional adequacy assessment
- Procurement and design review support
- Preventive Maintenance Plan execution (contracted work)
- ECM and sustainability investments (with interagency partnerships)

The overall approach of the ABCs Initiative was effective and necessary to provide the intended support. The additional funding, support staff, and expertise provide immediate assistance and tools that will continue to benefit the host agencies in subsequent years. The successes and challenges strengthened relationships between the ABCs team and host agencies and set a trajectory for continued action.

8 References

HHF. 2011. U.S. Insular Areas Education Facility Inventory and Condition Assessment Study Phase 1 Report.

HHF. 2017. Organizational Sustainability Plans for American Samoa, Guam and USVI Departments of Education; prepared as part of the Insular ABCs Initiative.

HHF. 2021. Preventive Maintenance Plans for American Samoa, Guam and USVI Departments of Education; prepared as part of the Insular ABCs Initiative.

