



Capital Outlay Request Report
013 - College of Engineering, Thomas and Brown Replacement

Business Case Status

Pending Start

Request

Institution New Mexico State University ▼

Project Title College of Engineering, Thomas and Brown Replacement

Building	Building Age	Building GSF
THOMAS & BROWN HALL	0.00	0

Project Location See Campus Map

Project Map

Project Map Link

FY Priority # 1

Master Plan Priority #

1

Total Project Cost \$25,040,000

State Funding Request

\$25,000,000

Committed Match Funding \$40,000

Match Funding Source

FY20 BRR Institutional Funds

Construction Type New Construction

Previous Request Summary N/A

History of Facility The existing Thomas and Brown Hall (301) facility was constructed in 1971 for electrical engineering and dedicated in 1972. The cast in place concrete structure has been in service within the College of Engineering since completion. The existing structure consists of approximately 43,300 square feet, divided over 3 above grade stories and a basement level. The building is named for two different people. Melvin A. Thomas was a former professor and dean of engineering, and Harold A. Brown was a former professor.

Current Condition NMSU is currently working with Architectural Research Consultants to conducting Facilities Condition Assessments (FCA) off selected NMSU buildings. Thomas and Brown Hall (TBH) was part of the first group of buildings to be analyzed. The score for TBH is 0.5290 or Poor in the FCI and 54.80% in ARC's Score or an "F" (not condemnable yet, but in really poor shape). This is indicative that a significant amount of capital funding is needed for the building.

Renovation Information There have been no major renovations since Thomas and Brown was occupied almost fifty (50) years ago. Minor renovations include a first floor lecture hall lighting and ceiling upgrade in 1991 used as a classroom for undergraduate students; roof repairs in 2008 and additional patching in 2013; and replacement of select toilet/urinal plumbing fixtures in 2014. The funding source for the plumbing fixtures was Building Repair & Renewal (BRR).

Scope of Work NMSU completed a College of Engineering Space Consolidation Study, dated June 2019, for consolidation of space alternatives as basis for space planning and potential use within the COE as a whole. The study provided direction on how to consolidate departmental space, COE initiatives centered around modern, open work areas for experiential learning and engagement. The findings in the space study identified numerous issues with the existing aging structure, most notably the inefficiently sized floor plate, and cost of a full renovation rivaling the constructing cost of a new building. The more recent Thomas and Brown Hall Replacement Facility Feasibility Study, dated May 2021, along with an on-going Facilities Condition Assessment by an outside architectural consulting group confirmed these obstacles. As a result of this data, the decision to remove and replace Thomas and Brown was made. This project scope will abate and demolish the existing deteriorating structure (48,366 GSF) and construct a new replacement facility to be located in the same location following demolition. The new construction will be a smaller (approximately 31,832 GSF) state-of-the-art facility. The replacement for TBH will be an instructional facility that provides flexibility with proportions that supports modern instructional and research laboratories possibly combined with other common College of Engineering (COE) functions and needs. Thomas and Brown Hall existing facility facts: 1. Since 2016, classes have been canceled two or more times per year due to HVAC failures. 2. Computer systems regularly experience thermal shut-downs due to high temperatures in the building. 3. Thomas and Brown Hall (TBH) has several accessibility concerns. This includes the roof, which is used for solar power generation studies and telecommunication research. 4. None of the classrooms in Thomas Brown have external windows. 5. Every teaching lab in TBH requires floor fans to regulate the temperature during the late spring and early fall. 6. Sewage floods occur in TBH regularly. Two years ago, a significant event flooded the elevator sub-floor and caused enough damage to merit the elevator's replacement. The overall goals include modernization, flexibility, collaboration, and innovation, which are all lacking in the constraints of the existing structural layout, floor-to-floor height, and presence of natural light. NMSU has completed a pre-programming study for the replacement facility for multidisciplinary experiential learning spaces, including collaborative learning spaces. The new building is approximately 23,000 NSF, total 31,832 GSF. The first floor has maker spaces, two classrooms, a lab, lobby, student lounge and conference interactive spaces. The second floor includes capstone workrooms, four (4) labs, six (6) offices, and storage/support areas. The third floor has a rooftop experiment area and flex-space, along with utility rooms for mechanical, electrical and IT closet. The entire program has to be designed to be responsive to recruitment challenges, changes in environment presented to COE by their Advisory board, and to support the COE mission of Academics, Research, and Leadership. Specific conversations concerning teaching trends, the impacts of COVID 19, and its related distance learning requirements had an impact in the formulation of the final building program. Student learning communities become casual meeting places for students to interact, study, and collaborate. These communities contain open flexible spaces, small group meeting areas, tutoring, conference/distance learning capabilities and support areas. Aggie Innovation/Makers spaces are upfront and on display as a COE showcase for student retention, recruiting and curiosity for passers by. The innovation areas allow the COE to put their best foot forward in training students for future employment and research. General classroom spaces depart from standard lecture halls with fixed seating and allow students to go from large lecture experience to small group project areas without having to leave the classroom space. This allow for higher space utilization with the COE as the spaces do not become depart or college specific. Approximately \$3.1 million of this project cost is reserved for a small addition to the Engineering Complex I (ECI) for an expansion for the Aggie Innovation Space (AIS). NMSU recently completed a College of Engineering, Aggie Innovation Space (AIS) Consolidation Study, dated May 2021 with Architectural Research Consultants (ARC). ARC was tasked with identifying space for multi-disciplinary experiential learning for the the colleges of Engineering, Arts & Sciences, and Agricultural, Consumer, and Environmental Sciences (ACES). The proposed multi-disciplinary experiential learning space in the College of Engineering is the Aggie Innovation Space (AIS). AIS currently occupies multiple spaces in EC I and Ed and Harold Foreman (EC III). The College of Engineering desires to consolidate and expand AIS functions located on the first floor of EC I east to an existing exterior storage area to make the resources to be more visible and accessible to the entire University.

Phases

Complete table if this project request contains multiple projects or if the project can be phased. List in priority order:

Phase #	Description	Part of Request	Amount	Start Date	End Date
1	Full Project	<input type="checkbox"/>	\$0.00	7/1/2023	12/31/2025

Students Impacted

Provide the instructional program majors being served by this project:

Major	HeadCount	FTE	% Growth Last Year	% Growth Average
Chemical and Materials Engineering	206	126	-4	2
Civil Engineering	274	136	-5	-2
Electrical and Computer Engineering	307	156	-10	-4
Engineering Physics	30	0	3	-2
Engineering Technology and Surveying Engineering	464	354	-3	-2
Industrial Engineering	100	73	-19	-11
Mechanical Engineering and Aerospace Engineering	751	294	3	0
Total (includes engineering undeclared students)	2143	1138	-3	-1
	0	0	0	0
	0	0	0	0
	0	0	0	0

Enrollment

Provide Fall Semester enrollment data per year as reported on the NMHED website/eDEAR:

Year	FTE	OFTE
2013	16754	2142
2014	15821	2047
2015	15484	1985
2016	14826	1753
2017	14445	1627
2018	14297	1708
2019	14274	1792
2020	14216	4912

B. Project Rationale and Need:

Measure B1: Projects promotion of enrollment growth, retention, and degree production

B1 Score Substantially

B1 Explanation The Thomas Brown replacement will serve as the College of Engineering focal point and highlights the College’s student-centric approach. The building will house the Learning Communities, the Department of Electrical and Computer Engineering (ECE), and the Aggie Innovation Space design area. The Learning Community focuses on Student Success and developing leadership and communication skills essential for success in the modern engineering workforce. The Aggie Innovation Space plays a major role in advancing experiential learning opportunities for students, not only from engineering but also from other sciences and humanities disciplines. The Aggie Innovation Space allows faculty and students to work more closely with business, industry and community partners to advance technology innovation, entrepreneurship through technology design and validation, and support advanced research in emerging areas. It serves as a gathering point where students in the College of Engineering Capstone Design Program can apply their classroom knowledge to real problems, experience the professional engineer’s working world, practice project management, teamwork, communication and other soft-skills, and execute the engineering design process. These activities contribute to the enrollment growth, retention, and degree production in engineering and in other colleges at NMSU. The building will house several of the ECE Department research groups and provide space for classes and labs. For the past several decades, the NMSU Power Lab led the US in renewable energy research and produced graduates that satisfy regional workforce needs. The extensive collaborations with Sandia National Laboratory and El Pase Electric demonstrate the Power Program’s strength. Since 2018, the ECE Department has enjoyed triple-digit gains in research funding awards. The aging infrastructure of Thomas Brown threatens this growth. The Department of ECE loses a significant number of new students each year due to the outdated facilities. For example, the ECE Department increased recruitment activities in 2017. This strategy led to an increase in admitted students from 116 to 188 from 2017 -2020. However, the freshman enrollment numbers remained flat at about 55. More students applied to NMSU-ECE, more students were admitted to NMSU, but the number who enrolled did not increase due to the inadequate facilities. We anticipate state-of-the-art labs and classrooms will recover this loss.

Measure B2: Projects impact on education and workforce needs in local and regional economies

B2 Score Substantially

B2 Explanation The key to New Mexico economy’s long-term stability is to reduce the State’s dependency on the extraction industry. New Mexico has done an excellent job in establishing the needed groundwork to attract high-tech industry to the State. The Space Industry and the Energy-Water-Food nexus are two examples. Economic expansion depends on a highly trained and available workforce that included all engineering disciplines. The College’s Eloy Torrez Learning Communities, housed in the Thomas Brown replacement building, will support workforce development. Of particular importance is the production of Electrical and Computer Engineers to support growth in the Energy and Space sectors. The replacement building will support the specific workforce need by housing the ECE Department, including the power research group and the space systems group. The Aggie Innovation Space is a state-of-the-art facility where students and faculty can engage with Industrial partners/sponsors through real-world projects, high-tech methods and equipment, and manufacture-ready projects. The Aggie Innovation Space has supported over 70 capstone projects with over 400 students, supported 30 student and faculty research projects, and 27 Arrowhead Center projects through the FIX and NMSBA programs. These activities have increased the education and workforce needs in our local and regional economies. Currently the Aggie Innovation Space is located in three different areas which makes it difficult to meet the needs of the students, faculty, and out outreach activities. Consolidation of the facilities will help us better serve the needs of the NMSU community and our local and regional community members.

Measure B3: Projects support of HEI Strategic Plan or Facility Master Plan

Demonstrate project alignment with institutional mission and how project advances the institution’s strategic or facility master plan.

B3 Score Substantially

[Master Plan](#)

[Master Plan Link](#)

B3 Explanation This project positively impacts all four major areas of NMSU LEADS 2025. Specifically, it impacts Goal 1 by creating a collaborative learning experience for students without creating a departmental boundary (Objectives 1.3 and 1.4). The Aggie Innovation Space part of this project provides experiential and entrepreneurial learning opportunities for all NMSU students. The project does not follow conventional departmental boundaries. Although it houses Electrical and Computer Engineering department, its faculty will be grouped with other allied disciplines in other departmental buildings; therefore, more space is accommodated in this project for collaborative learning. It impacts Goal 2 (Elevate Research and Creativity) by encouraging team participation and eliminating departmental separation. Technology transfer and outreach are crucial components of engineering at any land grant university. Aggie Innovation Space teams up with industries to bring real world problems and challenge our students in capstone design classes. Also, it teams up with Arrowhead to facilitate commercialization of creative work produced by our faculty and students, thus amplifying outreach and extension (Goal 3). This project will optimize space utilization in the college and improve the effectiveness of our research and teaching activities. It will enhance the work climate, promote teamwork, and eliminate dead or unused spaces because of its underlying strategy of collaborative learning. It will be a model for a robust learning environment on the campus (Goal 4). Thomas and Brown hall, home to the electrical engineering department is specifically listed in the campus master plan as the next engineering facility in need of funding.

Measure B4: Facilities Assessment

Provide the facility’s most recent condition score and summarize the major structural and systems conditions that resulted in that score. Provide selected supporting documentation in appendices and reference them in the body of the proposal.

B4 Level of Study Completed Substantially

[Study](#)

[Study Link](#)

Cost to Repair \$5,171,261

Cost to Replace

\$9,750,102

Replacement Cost Basis (\$ per SF) \$0

Cost to Repair AFTER Project

\$0

B4 Explanation The demolition of Thomas and Brown Hall (TBH) Replacement project will remove aging and deteriorating facilities, and reduce maintenance costs. See attached FCI information for the campus and summary for TBH facility. Architectural Research Consultants Inc. (ARC) 2021 evaluation: Thomas and Brown score 0.5290 or Poor in the FCI and 54.80% in ARC’s Score or an “F” (not condemnable yet, but in really poor shape.) This is indicative that a significant amount of capital funding is needed for the building. ARC’s preliminary cost estimate in the amount of \$5.3 million dollars plus NMGRT in construction related renovations only begins to bring the dated building up to current code, meet ADA requirements, improve the HVAC and electrical, replace existing finishes, and renovate existing classrooms. All of these recommended renovations

only begin to bring the existing building up to current standards/codes and do not begin to touch the goals and need of the COE. The FCI is an indicator of the overall condition of a building; calculated by dividing the maintenance, repair and replacement deficiencies of the facility by the current replacement value of the facility. NMSU is currently in the process of updating FCI system-wide for all of the campuses. We have hired a third party licensed architect and professional evaluation team to assess. Of the 22 completed buildings at the academic core, Thomas and Brown Hall (TBH) has received a rating of Poor. Full building evaluations for TBH, assessment of building condition and recommendations, were completed in March and April 2021.

Measure B5: Projects impact on On-campus and Off-campus Instruction

Provide information on how this project request will support both on-campus and off-campus instruction.

B5 Score Substantially

B5 Explanation NMSU College of Engineering Las Cruces offers online synchronous and asynchronous courses as well as face-to-face courses. Approximately twenty percent of all courses taught at the college are online. Due to the increased use of new digital learning tools, the importance of this mode of delivery has increased, and graduate Masters of Engineering degree programs are expected to grow in the Department of Electrical and Computer Engineering as well as throughout the college. However, a significant number of college classes are face-to-face and due to our projected use of the building as accommodating an expanded use of Learning Communities for coursework there needs to be multiple ways to accommodate learning. The College of Engineering will need to meet this need by having more modern, versatile, and interactive classrooms that can support hybrid, online, or face-to-face classes. The improvement of the classroom space at Thomas & Brown will improve students' ability to work in learning communities and individually in hybrid, face-to-face, online, or face-to-face classes. The extensive use of portable lab kits will also enable flexible learning spaces for students who can communicate with the class and others through Canvas Zoom. This will create an inclusive environment for learning in which more students will be comfortable enrolling in the college and accommodate their time and location needs. The improvements in the classrooms for Thomas and Brown will allow for more students to be served in this capacity and assist the college in enhancing to attract, retain, and graduate students.

C. Green Screen for Buildings

Measure C1: Energy Audit or similar energy assessment

Document details of the audit to include who performed the audit, when it was completed, level of audit/assessment, improvements proposed, and benefits to this project

C1 Score Substantially

Energy Audit Completed Yes No

[Energy Audit](#)

[Energy Audit Link](#)

C1 Explanation In 2013 Ameresco preformed an investment grade audit of 46 of NMSU's buildings throughout the state, totaling nearly 2.7 million gross square feet. The audit included the facilities at Alamogordo, Carlsbad, Dona Ana Community College, Grants, remote Agricultural Science Centers, and all buildings on the main campus. NMSU also employees two Certified Energy Managers (CEM) who can look at the potential energy savings of projects. Renovation work will be done following Green Screen standards, with goals of achieving additional energy cost savings. List of Green Screen strategies that will be incorporated in the project during construction include: • Construction waste management principles will be followed during the demolition. • Recycling of applicable materials. • Construction waste management principles followed during construction.

Measure C2: Projects impact on Energy / Utility Cost Reduction

Explain the impact of this project to the net energy / utility costs. Provide a justification if no operating budget impact is anticipated.

Current Energy Usage \$0 **Energy Usage AFTER Project** \$0

C2 Explanation Thomas and Brown is planned to be abated and demolished to be replaced with a newer, more efficient but smaller building. The newer spaces will be built with more energy efficiency measures compared to the current space which was built in 1972. NMSU's building guidelines includes policies to encouraging energy reduction with nearly every project. Additionally, there have been specific projects focusing on energy reduction such as the Ameresco projects. With each project resulting in energy savings there will also be a utility cost savings which can result in an observable change. When the equipment is replaced with more efficiency there will be a reduction in costs. However, the equipment change can also change the system maintenance requirements as well and without knowing what the replacement system will be we are unable to make accurate predictions.

Measure C3: Executive Order (EO) 2019-003

Provide detailed information on how this project will address the goal of reducing Green House Gas (GHG) emissions by 45% as called for in the EO. Explain the steps taken to reduce the buildings energy demands.

C3 Score Substantially

C3 Explanation Over 95% of NMSU's scope 1 and 2 emissions are building emissions. Reaching the goals within EO 2019 -003 for greenhouse gas emission reduction remodeling and updating existing infrastructure will be required. Approximately 40% of commercial building's energy use is from the HVAC systems. Therefore, projects focusing on upgrading existing HVAC systems can have a noticeable impact on the GHG emissions.

D. Stewardship - Detail how the HEI provides stewardship for its assets.

Measure D1: Project Estimates

Describe how this projects cost estimates were developed. Provide the total dollars attributed to inflation. Percentage increases MUST be defended in the narrative portion of the document, or 0% inflation will be assumed.

D1 Score Substantially

Base Project Estimate \$20,346,271 **Dollars Related to Inflation** \$623,510

Formal Estimate Provided Yes No **Formal Estimate** **Estimate Link**

D1 Explanation

NMSU hired Studio d Architects to evaluate Thomas and Brown Facility Feasibility Study, completed May 2021. As part of this study the architect worked with a professional estimating company to develop project costs. Studio d Architects worked with our longtime partner Jack O'Neil of to help determine a probable cost for the demolition and new construct cost for the replacement facility. Estimates are based on a Schematic Design level estimate and based on both current and historical pricing for similar building types and construction locations. The estimate provided carry both a design contingency of 10% and a cost escalation per year of 2.56%. For the collaborative learning area, NMSU worked with Architectural Research Consultants (ARC), as part of a campus-wide space utilization study and follow up to the 2019 Space Consolidation Study for the College of Engineering study for the Aggie Innovation Space (AIS) Consolidation Study to identify the needed square footage and cost per square foot for an addition to the Engineering Complex I (ECI). ARC is based in Albuquerque, NM, and specializes in the areas of planning, architectural programming, facility evaluation, and architectural research. NOTE that the field above for Base Project Estimate is for the Thomas and Brown Hall Replacement Study only. The Aggie Innovation Space (AIS) Consolidation is a document uploaded and estimated separately.

Measure D2: Describe how this project addresses/reduces deferred maintenance on campus

Deferred Maintenance	\$146,266,717	Deferred Maintenance AFTER Project	\$0
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D2 Explanation

The approximate restoration cost is over \$5.1M and includes: • roof replacement, • roof safety upgrade, • window replacement, • flooring replacement, • classroom renovation, • ADA compliance for door hardware, restrooms, signage and stairways, • electrical upgrade, and • HVAC replacement Maintenance, Repair, and Replacement Deficiencies of the Facility(-ies) FCI = -----
 ----- Current Replacement Value of the Facility(-ies) In the 2021 evaluation by ARC, the FCI score is 0.514 and is a poor rating.

Measure D3: Asset Stewardship Provide information on how the HEI supports the ongoing operational and maintenance needs of current and proposed assets.

D3 Score

Substantially ▼

Level of Plan

Substantially ▼

BRR Plan

BRR Link

D3 Explanation

Facilities and Services receives an annual funding allocation for Building Renewals and Replacements (BRR). Facilities and Services receives an annual allocation for capital renewal and we created a Building Renewals and Replacements (BRR) task force that met every other week for a year to develop a 3-5 year BRR plan. This past year, an internal, cross-sectional team met bi-weekly for a year to assess each building system. This led to the creation of what we called a 3-year plan, although by design the listed needs exceeded the available funding so in places we also called it a plan for the next five years. We made presentations and prepared a BRR booklet. We used a number of reports that we have commissioned in the development of this plan: Roof Assessment by BTA; ThyssenKrupp Elevator Assessment; AON Fire Protection and Life Safety System Assessments; Bohannon Huston Site Electrical Infrastructure Master Plan; GLHN Utility Development Plan; Accessibility Survey of Campus Buildings; NMSU Data Center Planning Report; Las Cruces Campus Drainage Study; Structural Integrity Study for the NMSU Utility Tunnel; Chemistry and Biochemistry Exhaust System Study; and the Water Master Plan. This Building Renewals and Replacements plan was put together with input from staff in Facility Operations, Project Development and Engineering, Environmental Health and Safety (EHS), the Fire Department, the University Architect, and the University Engineer.

Measure D4: Maintenance Cost Reduction

Describe in detail how this project will affect operating appropriations for the current year and all out-years. Provide a justification if no operating budget impact is anticipated.

Total O&M Budget	\$0	Total O&M Budget AFTER Project	\$0
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D4 Explanation

Replacement for Thomas and Brown is expected to minimize operation and maintenance costs. Currently, the vast number of band-aid repairs is becoming very ineffective to maintain the building. No additional space is requested beyond what's currently available in engineering. It is not expected that new staff would be needed with the Thomas and Brown replacement. Maintenance Analysis: NMSU performs regularly scheduled custodial, maintenance and project support at Thomas and Brown. Project support are deferred maintenance projects and renovations to the facility to meet the Electrical Engineering department's academic mission. The cost analysis was generated for the period of Fiscal Year 16 through Fiscal Year 20. During this time frame NMSU spent \$436,795.00 to perform routine maintenance and operations. Additionally NMSU spent \$437,914.00 on facility system modernization and deferred maintenance projects. Total expenses for the five year period were \$874,710.00. Thomas and Brown has a facility condition index score of 0.514 which is on the borderline of a poor rating. Demolishing the existing facility and constructing a new state of the art educational facility will result in maintenance savings. The proposed facility will be approximately 31,000 GSF which is 17,000 GSF, 36%, less than the existing facility. NMSU anticipates projected average annual savings of \$17,785.00 in Corrective Maintenance costs and \$21,744.00 in Custodial costs for \$39,529.00 total savings. The new facility will be activated with a robust Preventive Maintenance program and the projected annual average cost will increase from \$1,717.00 to \$5,670.00. This increase of \$3,953.00 for preventive maintenance would reduce the total average annual cost savings \$35,576.00. These savings will be reinvested in scheduled maintenance for other academic facilities on campus. Project Development: Facilities Operations needs to be an active participant in the project design. Maintainability and reliability should be key factors in the design. See Thomas and Brown Maintenance Analysis narrative and table that identifies Thomas and Brown Fiscal Year Maintenance Costs by Category. The grand total for the past five years maintenance costs is \$874,710.

Measure D5: Health, safety, and security

Describe how this project will address major health and safety issues/concerns on campus, including how it will improve physical safety and cybersecurity on campus. Provide selected supporting documentation and reference them in the body of the proposal.

D5 Score

Two or more plans ▼

Level of Plan

Level 1 ▼

HSS Plan

D5 Explanation

Removing a deteriorating and unsafe structures from the campus inventory (replaced by new development), will improve safety. Building code provisions address structural stability, fire safety, adequate means of egress (exits), sanitation, safe wiring and more. It is the code official's responsibility to protect the public health, safety and welfare in relationship to the built environment through effective code enforcement. The new facility will be constructed to current codes and standards, including life safety and accessible roof access for research space.

Appropriation Language

\$25,000,000 to plan, abate, demolish, design, construct, renovation, furnish and equip a replacement facility for Thomas and Brown Hall and Aggie Innovation Space addition at Engineering Complex I (ECI) at New Mexico State University- Las Cruces.

Follow up Questions

Starting Fiscal Year	2021	Expense Type		
Planned Project Start		Planned Project Finish		
Investment to Date	\$0	Funds Needed By		
Discounting Switch	Off	% Complete	0%	
Discount Rates	2022: 0.00%	2023: 0.00%	2024: 0.00%	2025: 0.00%

Forecast

	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total	Notes
Pre-Project							Definition: Non-recurring cost to get to an approved and funded project.
Internal Staff Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
Internal Contract Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
External Staff Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
External Contract Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
Software \$	\$0	\$0	\$0	\$0	\$0	\$0	
Hardware \$	\$0	\$0	\$0	\$0	\$0	\$0	
Facilities and Power \$	\$0	\$0	\$0	\$0	\$0	\$0	
Internal Services \$	\$0	\$0	\$0	\$0	\$0	\$0	
Outside Services \$	\$0	\$0	\$0	\$0	\$0	\$0	
Telecom \$	\$0	\$0	\$0	\$0	\$0	\$0	
Other \$	\$0	\$0	\$0	\$0	\$0	\$0	
Total Pre-Project	\$0	\$0	\$0	\$0	\$0	\$0	
Project							Definition: Non-recurring cost to implement and field the product or service.
Internal Staff Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
Internal Contract Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
External Staff Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
External Contract Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
Software \$	\$0	\$0	\$0	\$0	\$0	\$0	
Hardware \$	\$0	\$0	\$0	\$0	\$0	\$0	
Facilities and Power \$	\$0	\$0	\$0	\$0	\$0	\$0	
Internal Services \$	\$0	\$0	\$0	\$0	\$0	\$0	
Outside Services \$	\$0	\$0	\$0	\$0	\$0	\$0	
Telecom \$	\$0	\$0	\$0	\$0	\$0	\$0	
Other \$	\$0	\$0	\$0	\$0	\$0	\$0	
Total Project	\$0	\$0	\$0	\$0	\$0	\$0	
Post-Project							Definition: Recurring cost to support the product or service through the end of the planning horizon.
Internal Staff Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
Internal Contract Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
External Staff Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
External Contract Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
Software \$	\$0	\$0	\$0	\$0	\$0	\$0	
Hardware \$	\$0	\$0	\$0	\$0	\$0	\$0	
Facilities and Power \$	\$0	\$0	\$0	\$0	\$0	\$0	
Internal Services \$	\$0	\$0	\$0	\$0	\$0	\$0	
Outside Services \$	\$0	\$0	\$0	\$0	\$0	\$0	
Telecom \$	\$0	\$0	\$0	\$0	\$0	\$0	
Other \$	\$0	\$0	\$0	\$0	\$0	\$0	
Total Post-Project	\$0	\$0	\$0	\$0	\$0	\$0	
Total Cost	\$0	\$0	\$0	\$0	\$0	\$0	

	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total	Notes
Revenue							Definition: Incoming revenue associated with the product or service.
<Source 1> \$	\$0	\$0	\$0	\$0	\$0	\$0	
<Source 2> \$	\$0	\$0	\$0	\$0	\$0	\$0	
<Source 3> \$	\$0	\$0	\$0	\$0	\$0	\$0	
<Source 4> \$	\$0	\$0	\$0	\$0	\$0	\$0	
<Source 5> \$	\$0	\$0	\$0	\$0	\$0	\$0	
<Source 6> \$	\$0	\$0	\$0	\$0	\$0	\$0	
<Source 7> \$	\$0	\$0	\$0	\$0	\$0	\$0	
<Source 8> \$	\$0	\$0	\$0	\$0	\$0	\$0	
Total Revenue	\$0	\$0	\$0	\$0	\$0	\$0	
Cost Reduction							Definition: Money saved that is being spent today. True cost take-out.
Internal Staff Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
Internal Contract Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
External Staff Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
External Contract Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
Software \$	\$0	\$0	\$0	\$0	\$0	\$0	
Hardware \$	\$0	\$0	\$0	\$0	\$0	\$0	
Facilities and Power \$	\$0	\$0	\$0	\$0	\$0	\$0	
Internal Services \$	\$0	\$0	\$0	\$0	\$0	\$0	
Outside Services \$	\$0	\$0	\$0	\$0	\$0	\$0	
Telecom \$	\$0	\$0	\$0	\$0	\$0	\$0	
Other \$	\$0	\$0	\$0	\$0	\$0	\$0	
Total Cost Reduction	\$0	\$0	\$0	\$0	\$0	\$0	
Cost Avoidance							Definition: Preventing money from having to be spent that is not currently being spent today.
Internal Staff Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
Internal Contract Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
External Staff Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
External Contract Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
Software \$	\$0	\$0	\$0	\$0	\$0	\$0	
Hardware \$	\$0	\$0	\$0	\$0	\$0	\$0	
Facilities and Power \$	\$0	\$0	\$0	\$0	\$0	\$0	
Internal Services \$	\$0	\$0	\$0	\$0	\$0	\$0	
Outside Services \$	\$0	\$0	\$0	\$0	\$0	\$0	
Telecom \$	\$0	\$0	\$0	\$0	\$0	\$0	
Other \$	\$0	\$0	\$0	\$0	\$0	\$0	
Total Cost Avoidance	\$0	\$0	\$0	\$0	\$0	\$0	
Total Benefit	\$0	\$0	\$0	\$0	\$0	\$0	

	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total
Total Pre-Project	\$0	\$0	\$0	\$0	\$0	\$0
Total Project	\$0	\$0	\$0	\$0	\$0	\$0
Total Post-Project	\$0	\$0	\$0	\$0	\$0	\$0
Total Cost	\$0	\$0	\$0	\$0	\$0	\$0
Total Revenue	\$0	\$0	\$0	\$0	\$0	\$0
Total Cost Reduction	\$0	\$0	\$0	\$0	\$0	\$0
Total Cost Avoidance	\$0	\$0	\$0	\$0	\$0	\$0
Total Benefit	\$0	\$0	\$0	\$0	\$0	\$0
Return	\$0	\$0	\$0	\$0	\$0	\$0
Cumulative Return	\$0	\$0	\$0	\$0	\$0	\$0
ROI %	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Cumulative ROI %	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Results

Total Investment Required (i.e. Total Cost):	\$0	Return \$:	\$0	Revenue % of Total Benefit:	0.00%
Investment to Date: (i.e. \$ Spent so far):	\$0	ROI %:	0.00%	Cost Reduction % of Total Benefit:	0.00%
Investment Remaining to Go:	\$0	Payback Period (in Years):	0.00	Cost Avoidance % of Total Benefit:	0.00%

Notes: 1) These metrics are designed to depict the strength of the business case by the type of benefit. A business case that has its strength in cost avoidance, particularly in the out-years, is not as strong a business case as one that commits to benefits earlier or that delivers cost reduction. 2) The payback period is the length of time required to recover the cost of the investment.



