

TECHNICAL ASSURANCE, INC.

SERVICES OVERVIEW



Building System Asset Management

Technical Assurance's ON-PNT® allows facility owners the ability to manage building system inventory, condition assessments and ongoing building system data within one central location. This technology provides for robust GIS mapping and automated reporting metrics for simple data consumption.



Roof Consulting

We are your partner for total roof management. With a team of highly trained roofing specialists, we deliver comprehensive solutions for the assessment, design and implementation of roofing projects of any scope and size. Our programmatic approach to roof management ensures that your roofing investment is optimized to extend the service life of the roof system and to reduce the total cost of ownership.



Façade Consulting

We offer vertical façade management services including masonry and concrete exterior walls, curtain walls, balconies, exterior insulation finishes, fenestrations (doors, windows and skylights) and structural consulting to diagnose the cause of structural distress. We design repairs and restorative solutions that protect the structural integrity and aesthetic design of the building enclosure.



Parking Garage Consulting

Technical Assurance provides comprehensive consulting services for both the restoration of existing parking areas and the construction of new structures. Our deep understand of the requirements for keeping your parking areas highly maintained and safe will help you operate with a low cost of ownership and extend the life of these necessary and valuable assets.



Exterior Hardscapes Consulting

Your exterior hardscapes serve as a first impression and welcome visitors to your facility. Regular maintenance of these areas will increase perceived value of your facility and improve safety. Technical Assurance provides functional design consulting, durability recommendations and due diligence studies, as well as including your exterior hardscapes into your building system asset management program.



Building Enclosure Commissioning

The Technical Assurance full-service Building Enclosure Commissioning Group specializes in providing data-driven, quality improvement suggestions to new construction building design and performs functional testing during construction. Building enclosures directly affect the longevity and energy efficiency of a building. With a systematic approach to quality assurance, our Commissioning process improves the performance, safety and efficiency of a building and ensures that a project meets specific quality requirements outlined by the Owner.

TECHNICAL ASSURANCE, INC.



Technical Assurance, Inc. is a Cleveland-based, nationally-recognized building consulting firm founded in 1993. Technical Assurance, Inc.'s current staff of professionals manages building enclosure consulting and design for assignments of any size or scope. We are frequently asked to provide expert testimony and legal counsel consulting following forensic investigation. To-date, we have successfully delivered program solutions across 45 different states.



Our practice includes a considerable focus on solving a variety of building system deficiencies. Areas of expertise include roofs, façades, fenestrations (doors, windows and skylights), below-grade structures, parking areas and multi-level parking structures. In addition, a number of Technical Assurance clients engage the company to comprehensively manage their physical assets programmatically. These kinds of assignments generally include predictive and preventative maintenance, capital budget integration and even client staff training. We also have a full-service Commissioning Group to improve new construction building design and perform functional testing of the system during construction. Our Commissioning Group also provides Building Retro-Commissioning to improve existing building enclosure performance and energy loss.



Technical Assurance's success is due to our ability to lead the planning, design and implementation process for projects of any type, with a history of delivering projects on time and within budget. Our staff is committed to design excellence and client service with a team approach. Each program is approached individually, without preconceptions, and designed to serve the needs of the particular client – always with the goal of achieving excellence in delivery.



The professionals at Technical Assurance, Inc. have substantial critical facility industry experience. We have an extensive staff of consultants, engineers, field technicians, project and construction managers, database managers, GIS consultants, technical staff and office support. We maintain in-house capabilities to provide asset management and produce design drawings and project specs with complete cost estimating and budget preparation. Additionally, we continue to serve our clients with bidding services and construction administration during the entire course of the task, project or program. Our services are sought primarily by those clients who value their building assets as “critical” in running their daily operations.

5 STEPS TO SUSTAINABILITY

Technical Assurance's unique 5 Steps to Sustainability process ensures thorough, superior results in program assessment, planning, design and management. Our process-driven approach allows our team to systematically lead all phases of building envelope programs – providing a framework for collaboration and creative solutions.



Discover

Development of Owners Facilities Requirement (OFR), inspect, test, explore, excavate, evaluate and observe existing facilities and parking structures to develop an accurate condition assessment. This step frequently involves forensic investigation for facilities problems.



Plan

Prepare and develop repair programs and capital plans along with work schedule priorities based on discovery phase findings.



Solve

Meet with the Owner's Team and develop design (construction documents, plans and specifications) solutions for all building and parking conditions requiring repair, restoration and/or remediation.



Manage

Manage and administer the construction process to ensure cost control, energy savings, quality assurance requirements and compliance with construction documents.



Sustain

Implement and monitor preventive maintenance programs based on long-range component life-cycle forecast to reduce total cost of ownership.

PERFORMANCE TESTING

Code Section	Measure
Air Infiltration	
ASTM E283	Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
ASTM E779	Test Method for Determining Air Leakage Rate by Fan Pressurization
ASTM E1827	Test Method for Determining Air Tightness of Buildings Using an Orifice Blower Door
ASTM E783 Opaque Walls	Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors
ASTM E783 Windows	Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors
ASTM E1186	Practice for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems
Thermal Performance and Condensation Resistance	
ASTM C1153	Practice for Location of Wet Insulation in Roofing Systems Using Infrared Imaging
Water Penetration	
ASTM E331	Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
ASTM E514	Test Method for Water Penetration and Leakage Through Masonry
ASTM C1601	Test Method for Field Determination of Water Penetration of Masonry Wall Surfaces
ASTM D5957	Guide for Flood Testing Horizontal Waterproofing Installations
ASTM E1105	Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform or Cyclic Static Air Pressure Difference
AAMA 501.1	Standard Test Method for Water Penetration of Windows, Curtain Walls, and Doors Using Dynamic Pressure
AAMA 501.2	Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems
Durability and Appearance	
ASTM D4541	Test Method for Pull-Off Strength for Coatings Using Portable Adhesion Testers
ASTM E2359	Test Method for Field Pull Testing of an In-Place Exterior Insulation and Finish System Clad Wall Assembly
ASTM C794	Test Method for Adhesion-In-Peel of Elastomeric Joint Sealants
ASTM C1193, Appendix X1 - Method A	Guide for Use of Joint Sealants: Field-Applied Sealant Joint Hand Pull Tab

PROJECT EXPERIENCE

ABBOTT LABS

Client: Abbott Laboratories
(Nutrition Division)

Assignment: Roof Asset
Management Program Pilot

Size: 668,740 square feet

In December 2018, Technical Assurance performed an assessment on 11 buildings in Abbott Park as part of a Roof Asset Management Program Pilot. The assessment included a mixture of manufacturing, distribution and administration buildings totaling approximately 668,740 square feet of roof assets

The scope of work included:

- A customized Abbott ON-PNT enterprise asset management web portal, including GIS poly line drawings of each building roof section.
- The inventory and assessment of each roof building, included photo overview of the section and observed deficiencies. All deficiency type, location and quantities were input into the ON-PNT database.
- Data collected included condition indices, total and remaining service life, replacement cost estimates, effect cost estimates, total cost of ownership savings associated with repair and maintenance programs, ad repair and ongoing preventative maintenance programs.
- Final condition assessment report

During the assessment, our team discovered that the roof sections were in varying conditions – Excellent, Good, Fair, Poor, Bad, Very Bad and Failed – on a scale of 0-100%. The Pilot Program assessment was completed successfully and the relationship with Abbott Labs Nutrition Division is still developing.

TECHNICAL ASSURANCE

Location	
Site	Abbott_Park
Address	Abbott Park Rd, Abbott Park, IL 60004
MCN	90
Building No.	8021
Survey Category	New Survey
Survey Type	Roof Related
Blg Height (ft)	25.00

Roof Section Key plan image

Roof Section	
Roof ID	Abbott_Park-8021-RF01
Roof Section	RF01
UoF Area	3000
UoF Unit	Sq
UoF Est	Yes
UoF Method	3D/11 Roof Coverings
Roof System	11E/PA4-B
Roof System Details	Thermoplastic Ballasted
Roof System Group	18
SP	13.000
Assessor	Jim Mithran
Assessment Date	12/18/2018

Roof Overview image

Condition	
CI	Bad 44.26 %
Conditions	
PI	

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NESTLE

Client: Nestle

Assignment: Roof Assessment Program

Assessment Size: 5,499,288 SF Roofs

Reference: Macedonio Aldana
440.264.5247

Macedonio.Aldana@us.nestle.com

Technical Assurance was worked with Nestle to perform roof assessments on nearly 5.5 million square feet of roofs over fifteen (15) food manufacturing/production sites:

- Bakersfield, CA
- City of Industry, CA
- Danville, VA
- Fort Wayne, IN
- Freehold, NJ
- Gaffney, SC
- Jacksonville, IL
- Laurel, MD
- Little Chute, WI
- Medford, WI
- Morton, IL
- Mount Sterling, KY
- Solon, OH
- Springville, UT
- Waverly, IA

The inventory and assessment data was collected using the ON-PNT® mobile field app. Our team performed (and repaired) core cuts in order to determine the full roof system make up and to verify wet roof areas.


During the assessment, the following information was gathered, analyzed and included in the final reports:

- Roof deficiencies type, location and quantity
- Current leaks
- Existing defects requiring roof repair
- Roof related wall systems that may impact roof performance
- Photographic documentation
- Condition Indices
- Total Services Life and Remaining Service Life
- Replacement Cost Estimates
- Defect Cost Estimates
- Total Cost of Ownership savings associated with performing repairs and preventative maintenance

Following the assessment, Technical Assurance provides Nestle with multi-year repair and replacement plans based on both constrained and unconstrained budgeting models. Project prioritizations are determined by the Mission Criticality of the building and/or roof section, the condition index and the total cost of ownership.



Roof Overview Image



Condition		
CI		76.02 %
Conditions	Fair	
PI		
CI-RM		86.90 %
Condition-RM	Fair	
PI-RM		
CI-RPM		93.49 %
Condition-RPM	Good	
PI-RPM		
Life Cycle		
RSL		8
RSL-RM		12
RSL-RPM		15
TSL		19
TSL-RM		23
TSL-RPM		26
TSL Replace Yr Est	2027	
TSL-RM Replace Yr Est	2031	
TSL-RPM Replace Yr Est	2034	
Replace Cost Estimating		
RF Replace SF Price		\$19.00
Roof Replace Est		\$85,500.00
Roof Small SF Mult		0
CRV		\$85,500.00
Replace AEC Fees		\$8,550.00
Roof Project Budget		\$94,050.00
Roof Defects		

Sample Nestle Assessment Report



GIS Site Map Showing Roof Section Condition and Defect Locations

NOVANT HEALTH

Client: Novant Health

Assignment: Roof, Façade and Parking Garage Assessments

Size:

Roof: 2,479,267 Square Feet

Walls: 2,602,053 Square Feet

Garage: 1,837,437 Square Feet

Fall Protection: 180 Components
over 738 Roof Areas

Over the course of two (2) phases, Technical Assurance assessed the roofs, exterior façade and select parking garages on 13 medical and hospital centers. The facilities assessed include:

- Brunswick Medical Center
- Clemmons Medical Center
- Forsyth Medical Center
- Kernersville Medical Center
- Medical Park Hospital Center
- Prince William Medical Center
- Charlotte Orthopedic Hospital
- Haymarket Medical Center
- Huntersville Medical Center
- Matthews Medical Center
- Presbyterian Medical Center
- Rowan Medical Center
- Thomasville Medical Center

The project included the inventory and assessment of millions square feet of assets in order to determine their condition index on a scale from 0-100, the remaining service life and total cost of ownership. All collected data was input in ON-PNT for the ongoing management of facility data. Following the assessment, the data was analyzed to determine what life extension efforts would be beneficial for extending the service life and lowering the total cost of ownership, and capital and repair projects were triaged to objectively determine the order in which those projects should be performed.

Technical Assurance is now working with Novant on designing repair and replacement projects, providing bid services and quality observation throughout the construction.



CASE WESTERN RESERVE UNIVERSITY

Client: Case Western Reserve University

Assignment: Roof Remediation

Size: 36,500 SF

Project Complete: 2014



The Wolstein Research Building is an eight-story postmodern structure at Case Western Reserve University (CWRU) that opened in 2003 after two years of construction. Technical Assurance was called to investigate roof leaks in early 2011. The built up roof system was original to the building and was under the manufacturer's warranty at that time. The leaks presented in the building's stem cell research lab, among other locations, and had the potential to not only pose a real health risk but also to ruin the ongoing research, because the lab works with University Hospitals to provide stem cell therapy for patients.

Due to the sensitive nature of the work and the requirements to maintain a white-suit clean lab, these leaks needed to be stopped. Initial repairs to obvious damage were only minimally successful. Upon continued and increased broader investigations outside the immediate vicinity of the leak locations, Technical Assurance discovered that there were large areas of saturated insulation. These discoveries and the sensitive nature of the building requirements ultimately led to the decision to replace the relatively new roof system.

Technical Assurance was engaged to provide design services and to perform project management with full-time quality observation services during construction. In addition, Technical Assurance was also hired to ensure that the stem cell lab was able to remain open and operational at all times during the roofing project and do so within the stringent parameters required due to the sensitive nature of the research being conducted.

The roof replacement project was labor intensive and difficult due to several factors, among them being congested working areas. Due to the vast numbers, locations and sizes of rooftop HVAC equipment, vents, drains and other rooftop accessories, large equipment typically used to remove roofing with light weight insulating concrete was not viable and much of the work had to be done with more demanding and time-consuming measures.

CONFIDENTIAL FORTUNE 500

Client: Fortune 500 – Manufacturer of Tissue Consumer Products, Packaging, Building Products and Related Chemicals

Assignment: Roof Consulting

A Fortune 500 Company had plans to replace \$5 million in roof systems at one of their western US plant sites. They had been operating on a run-to-failure program model and were prepared for a full replacement.

Given the costs, the client engaged us to help them fully understand their investment options before moving forward with a complete replacement. After performing an initial assessment at their site, we found that only a portion of their roof sections required a complete replacement, while other sections still had useful life opportunities – provided a complete roof repair and restoration program was implemented immediately, along with annual roof maintenance. We pivoted to think about what could be done to extend the life of their assets while saving them money. The savings captured were substantial.

As a new partner, we serve as an objective third-party to financially analyze the building assets, ultimately helping our client view their buildings as a business investment. As part of our roof life cycle management program, we have established life cycle metrics for their roof assets to create accountability and set goals for savings—all while accounting for regular proactive maintenance during the life of the assets.

While this is still a fairly new partnership, we have already saved them a considerable amount of money in roof repairs and replacement projects alone. As we progress in our relationship with this company, our goals are to:

- Continue to assess and monitor opportunities for savings
- Keep roof systems on track with regular maintenance
- Lower cost of ownership by 15-20%



Savings & Successful Results with Life Cycle Management

The company was planning on a capital roof replacement spend of \$6.4 million over 10 years at the one site with no preventative maintenance included – \$4.5 million was to be spent to replace most roofs in the first year. Our professionals determined that they actually needed to spend only \$1.4 million on immediate roof replacements and \$1.7 million in restoration maintenance/life cycle investment in the first year, and then \$30k annually on preventative maintenance for the full alternate 10-year plan.

Not only did we help them avoid unnecessary replacements and save more than \$3 million over 10 years, but we also helped extend their roof assets for another 10 years.

ON-PNT[®]

ENTERPRISE BUILDING SYSTEM MANAGEMENT SYSTEM

OVERVIEW



Building System Asset Management Made Simple.

Enable a More Efficient Field Crew | Data Collection

- GIS HTML5 mobile app
- Increases efficiency and effectiveness
- App syncs with web portal every night

Brings Database to the Field & the Field to the Database | Dynamic Mapping

- GIS integrated database
- Easily visualize the condition of roof assets
- Analyze effects of repairs and maintenance

Analysis & Reporting: Performance, Metrics & Goals | Data Consumption

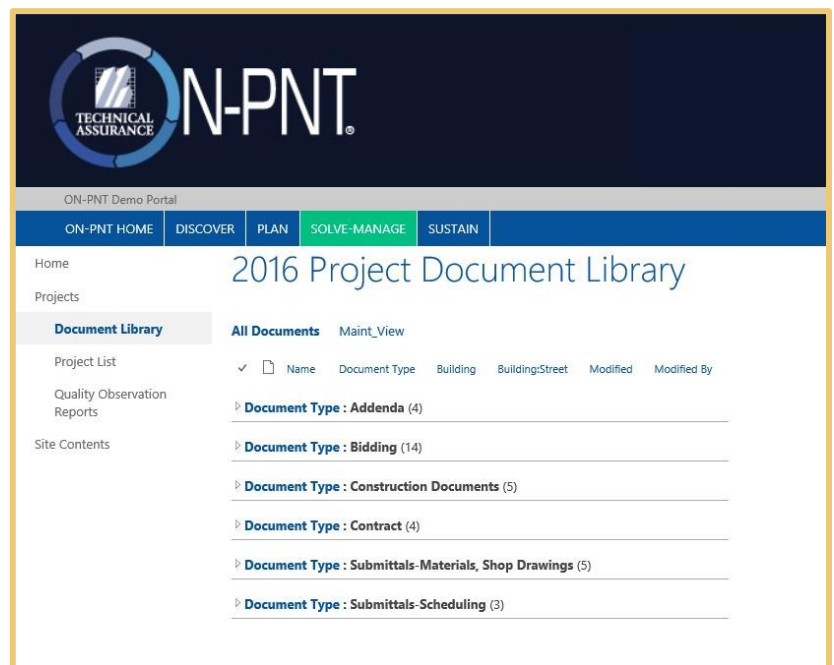
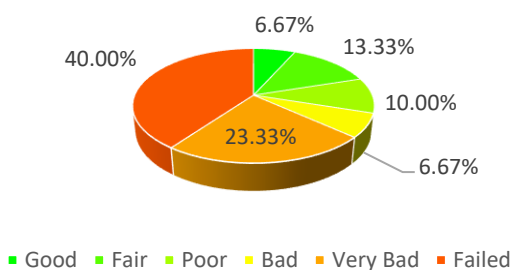
- High level executive summary metrics (KPIs)
- Scorecard review of building conditions
- Custom reports & charts
- Triage scores
- Constrained budget analysis tool
- GIS mapping

Simplified Management

- Robust project management tool
- Document & task management
- Schedule & cost management
- Data repository
- Warranty management & reminders



Portfolio Conditions (Current)



OVERVIEW

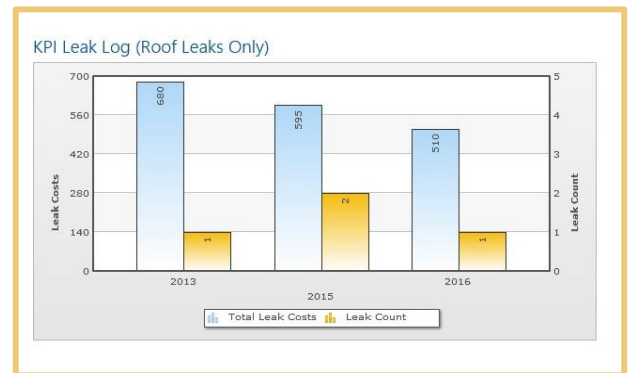


The ON-PNT® Enterprise Solution is a GIS (Geographic Information System) enabled database and web portal technology solution for **Building System Management, Design Services and Bid Management, Construction Management and Sustainable Maintenance Management**. ON-PNT® allows facility owners the ability to manage building system inventory, condition assessments, repairs and ongoing building system data within one central location. This cutting edge technology provides robust GIS mapping and automated reporting metrics for simplified data consumption.

ON-PNT® is fully customizable per client. In fact, we build a unique ON-PNT® Portal for each client program. This means we incorporate each client's unique program nomenclature, ID system, special acronyms, custom metrics, etc.

ON-PNT® is based on two open market platform solutions, ESRI ArcGIS Server and Microsoft SharePoint Portal. Technical Assurance has greatly customized and enhanced these open market platforms and has developed a unique 5 Steps to Sustainability™ Process to drive and manage this solution, which is trademarked as ON-PNT®. Deploying ESRI and Microsoft platforms ensures that our solution meets the most current security, browsing and up-to-date software enhancements on the market today.

A critical feature of ON-PNT® is the Score Card or Key Performance Indicators (KPIs). If definable goals, benchmarks and objectives cannot be met or tracked within an asset management program, how can we determine if and when adjustments and improvements are needed? The point of the KPIs is not to hit specific numbers, but rather to track trending goals and metrics. Done properly, **the asset management program should reduce emergency roof leak expenditures and the quantity of work orders, improve average building system life cycle and lower total cost of asset ownership**. These goals are measurable and therefore should be used for program accountability. ON-PNT® maintains these KPIs as our Score Card.



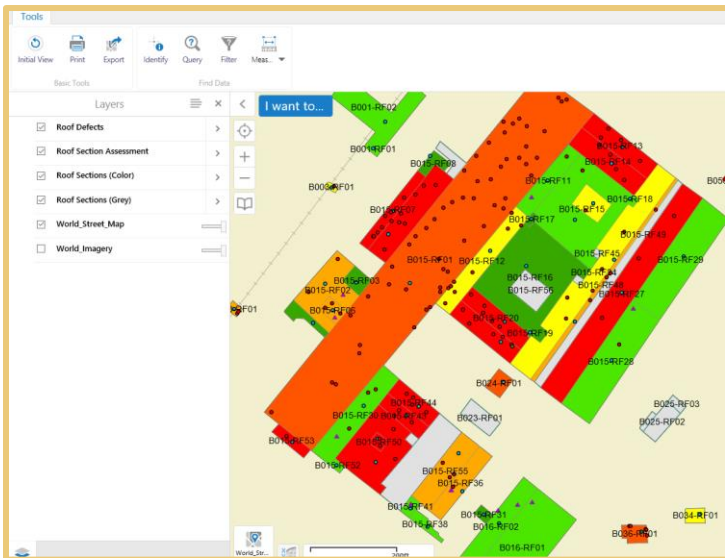
OVERVIEW



The ON-PNT® system provides **repeatable and objective analysis** using established facilities asset management (FAM) standards. The database is modeled using the following engineering standards:

- “Asset Lifecycle Model for Total Cost of Ownership”, IFMA/APPA
- ASTM E917-05 Measuring Life-Cycle Costs of Buildings and Building Systems
- ASTM E1057-06 Measuring Internal Rate of Return and Adjusted Internal Rate of Return for Investments in Buildings and Building Systems
- ASTM E1121-12 Measuring Payback for Investments in Buildings and Building Systems
- ASTM E1765-11 Standard Practice for Applying Analytical Hierarchy Process (AHP) to Multi-Attribute Decision Analysis of investments related to Buildings and Building Systems

Using these standards to work within the structure of our database, we ensure consistent findings and reporting with our Asset Management solution. The standards also allow us to bring in unique characteristics and attributes important to our clients from a non-monetary perspective.



Defect Pt: GF-Bruce_Mansfield... I want to...

Defect Code
BU-OL-M-1

Roof System Group
BU

Defect Type
Open Laps

Defect Acronym
OL

Defect Definition
Partially open - no water penetrating system

Specifications/Repair
Prepare surface, 1-ply MBR

Quantity
154

Comments
N/A

Legacy Data?
No

Legacy Name
N/A

Defect Status
Incomplete Manuf Warranty Defect

Print Map

Select Layout
Landscape ON-PNT Report

Output Format
Pdf

Map Scale
Current Scale - 1: 2257

Print

OVERVIEW



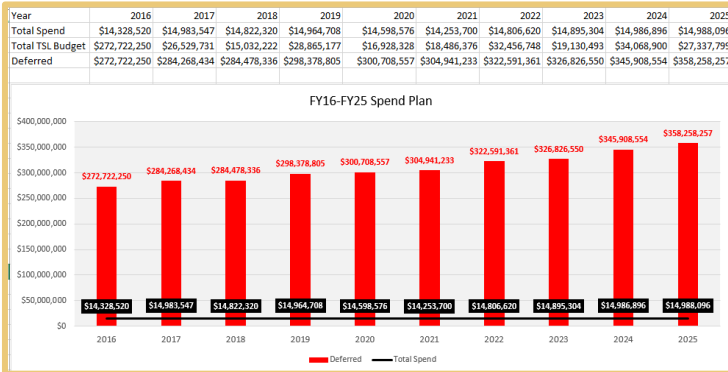
RECOMMENDATIONS & BUDGETING

ON-PNT® includes a built-in Business Intelligence for Capital and O&M budgeting and planning, along with work schedule priorities based on discovery phase findings. The automated budgeting reports include scientific methodology for ranking capital replacements and repair projects. The ON-PNT® Triage budget report and project analyzer tool is based upon the building or building system Condition Index (CI), Mission Dependency Index (MDI), System Component Index (SCI) and Total Cost of Ownership (TCO).

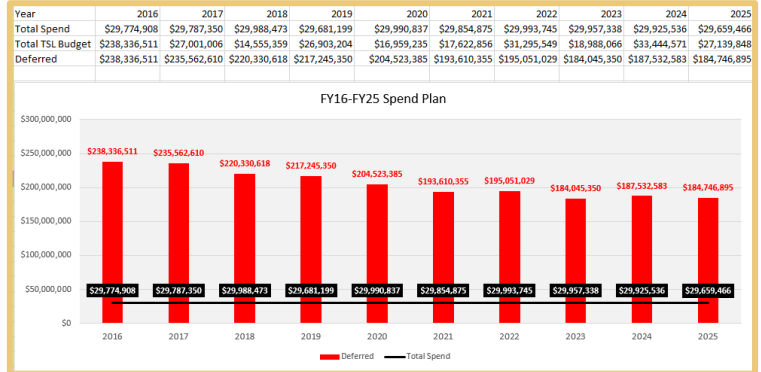


ON-PNT® lets you generate ad-hoc Triage Budget Plans based upon set budget constraints. You can also set your organization's inflationary rate and/or cost of capital or value of cash percentage rate. Once constraints and other rates are set, you can easily generate Triage Budget Plan and/or special Spend Plan and Deferred Maintenance Reports.

10-Year Spend: \$15 million/Year

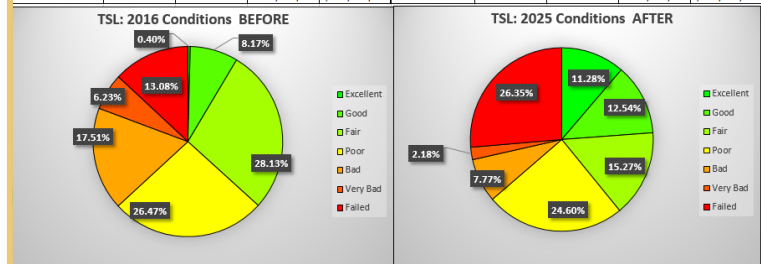
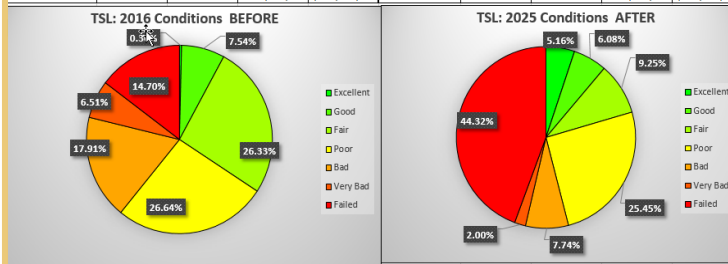


10-Year Spend: \$30 million/Year



Condition-2016	Count	%	SF	CRV	Condition-2025	Count	%	SF	CRV
Excellent	19	0.36%	141,501	\$5,215,598	Excellent	269	5.16%	965,418	\$39,233,204
Good	393	7.54%	1,519,097	\$60,841,379	Good	317	6.08%	1,007,499	\$39,538,526
Fair	1372	26.33%	4,886,007	\$203,565,215	Fair	482	9.25%	2,017,074	\$80,994,536
Poor	1388	26.64%	5,305,070	\$219,412,653	Poor	1326	25.45%	3,787,815	\$169,022,567
Bad	933	17.91%	3,251,802	\$128,076,573	Bad	403	7.74%	1,550,015	\$65,712,988
Very Bad	339	6.51%	1,337,673	\$51,012,639	Very Bad	104	2.00%	496,605	\$19,251,090
Failed	766	14.70%	3,163,517	\$112,813,771	Failed	2309	44.32%	9,780,841	\$367,184,915
	5210	100.00%	19,605,267	\$780,937,828		5210	100.00%	19,605,267	\$780,937,828

Condition-2016	Count	%	SF	CRV	Condition-2025	Count	%	SF	CRV
Excellent	20	0.40%	264,957	\$9,900,754	Excellent	563	11.28%	1,887,177	\$78,736,089
Good	408	8.17%	1,574,667	\$63,700,151	Good	626	12.54%	2,188,687	\$84,679,447
Fair	1404	28.13%	5,106,632	\$210,494,982	Fair	762	15.27%	3,352,259	\$131,195,586
Poor	1321	26.47%	4,972,542	\$205,112,767	Poor	1228	24.60%	3,440,155	\$152,941,882
Bad	874	17.51%	3,203,298	\$125,852,664	Bad	388	7.77%	1,440,571	\$61,339,598
Very Bad	311	6.23%	1,248,197	\$47,475,983	Very Bad	109	2.18%	488,327	\$18,441,678
Failed	653	13.08%	2,327,875	\$85,563,876	Failed	1315	26.35%	5,900,992	\$220,766,897
	4991	100.00%	18,698,168	\$748,101,177		4991	100.00%	18,698,168	\$748,101,177



Request a Consultation

We would love to talk with you about your facility needs.
Connect with us on our [website](#) to request a consultation.

Or Contact:

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