



Optimizing Healthcare Facilities

A Comprehensive Approach to Building
Performance and Safety

Introduction



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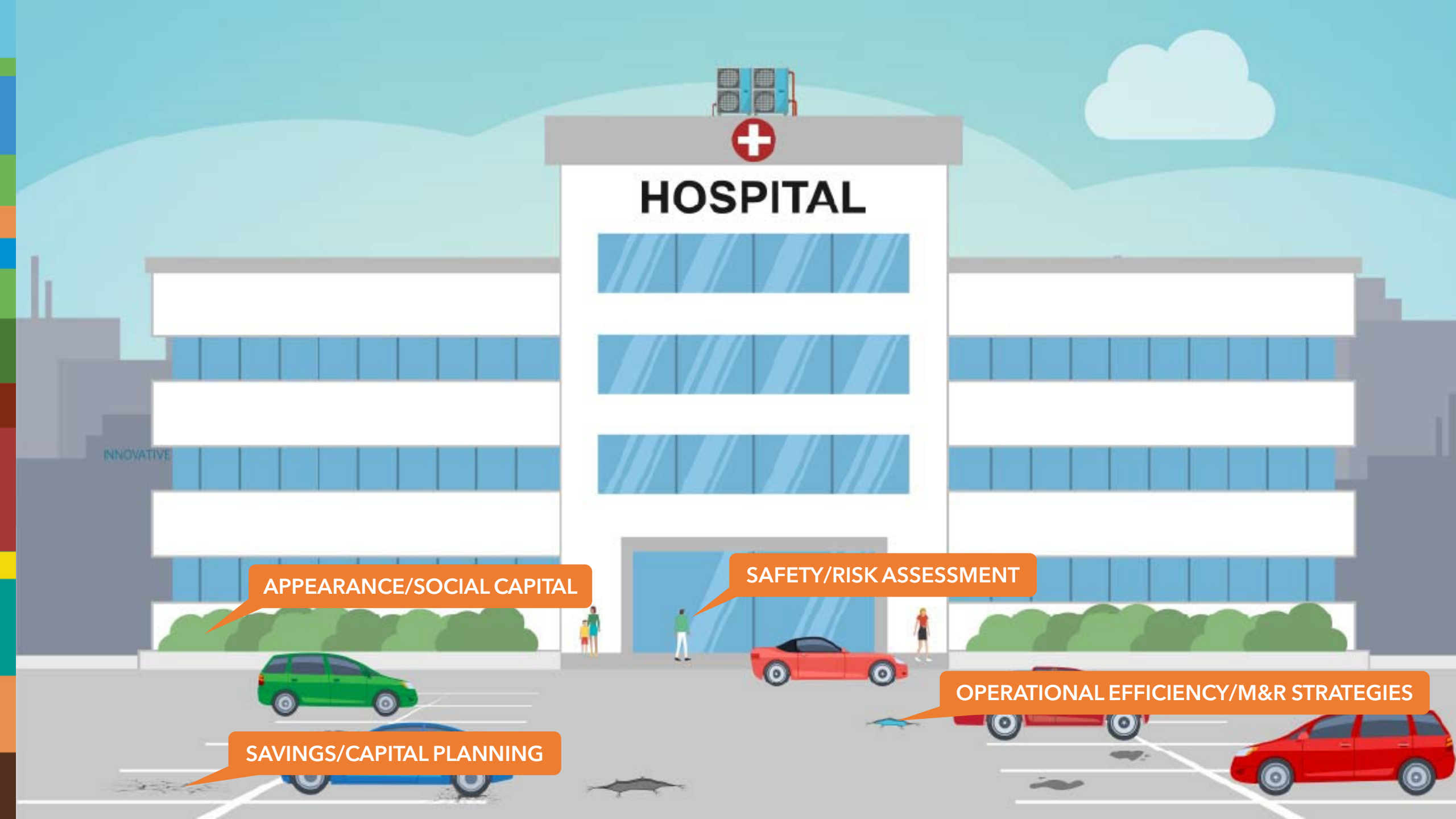
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Facilities Services



Pavement Consulting Services



HOSPITAL

APPEARANCE/SOCIAL CAPITAL

SAFETY/RISK ASSESSMENT

SAVINGS/CAPITAL PLANNING

OPERATIONAL EFFICIENCY/M&R STRATEGIES

Pavement Management Lifecycle

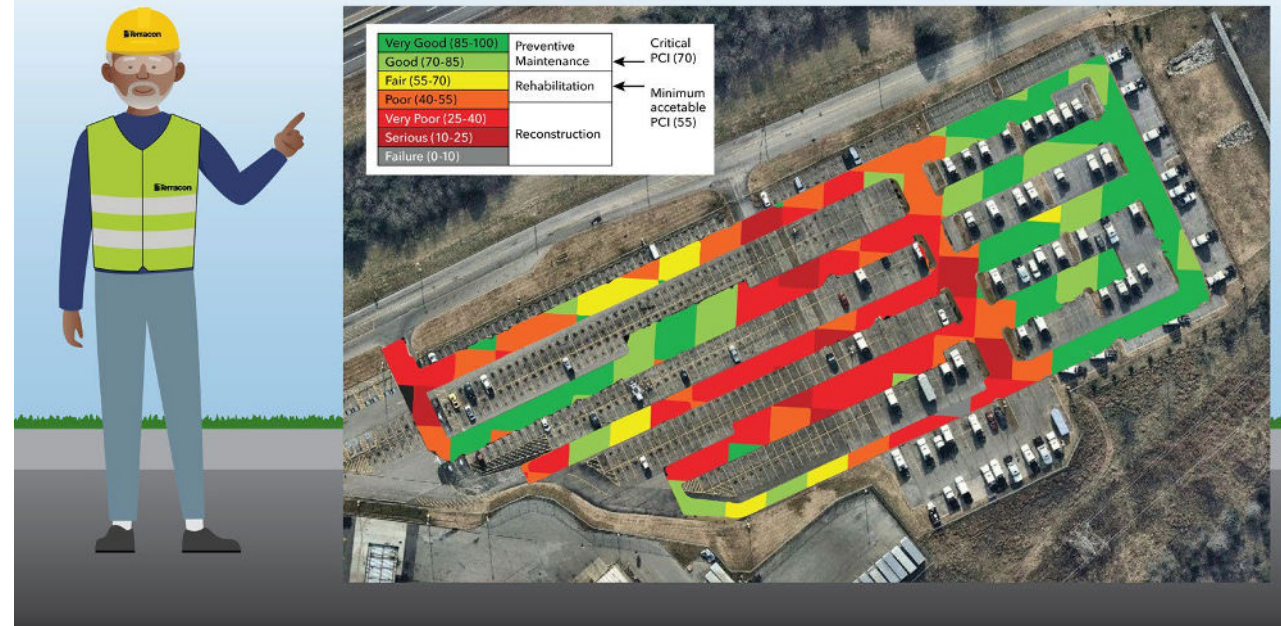


- Evaluations & Data
- M&R Strategies
- Designing / Bidding to your Budget and Specifications
- Saving Money through long-term Pavement Management

Evaluation Services

- Starts with an Evaluation – PCI scoring based on ASTM-D6433
- PCI scoring heatmap provided through the Terracon Pave-AI program
- Allows you to see exactly where you need to spend your money

Heat map data reveals damage levels



You may have experienced differing opinions and pricing from contractors.



This area looks bad,
let's replace
everything.

Based on the last PCI score
of 56, this damage has
worsened to a poor score
of 42. However, **ONLY** this
area needs reconstruction.

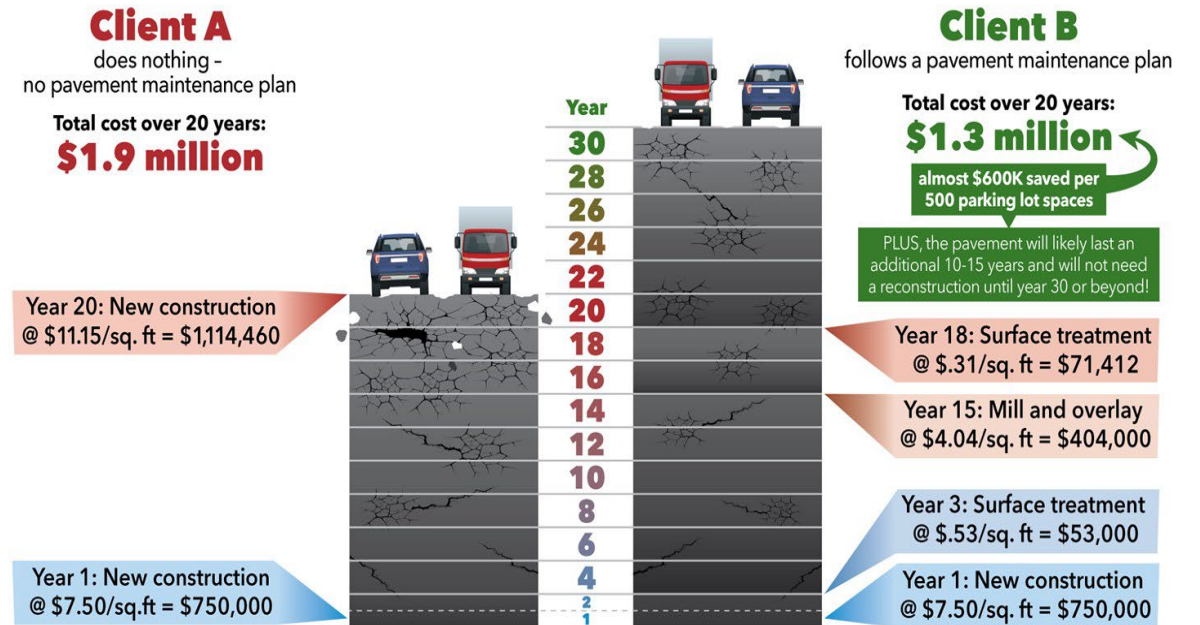


**Utilize a third-party, objective Pavement Engineer
whose opinion you can trust to have your interests
100% of the time.**

Savings – Capital Planning

- Utilizing a third-party, objective, and programmatic approach to Pavement Management
- BOTH
 - ✓ Extends the life of your pavement (from 20 to 30+ years)
 - ✓ Saves you significant money

How Pavement Management Can Save You Money





General

Do you have a strategic plan in place to manage your pavement assets?

Budgeting

How are annual capital expenditures allocated and prioritized?

Design

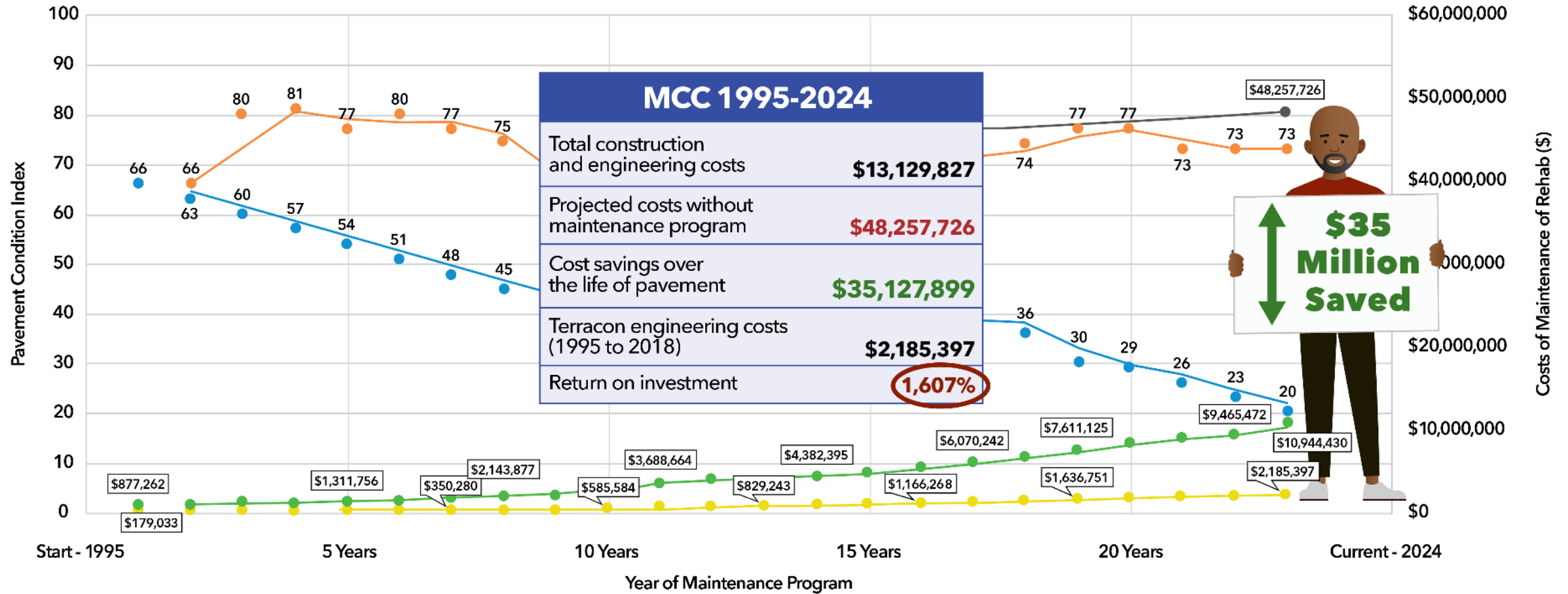
Is there a professional engineering team currently responsible for consistently, effectively, and efficiently managing your entire portfolio of facilities' pavements?

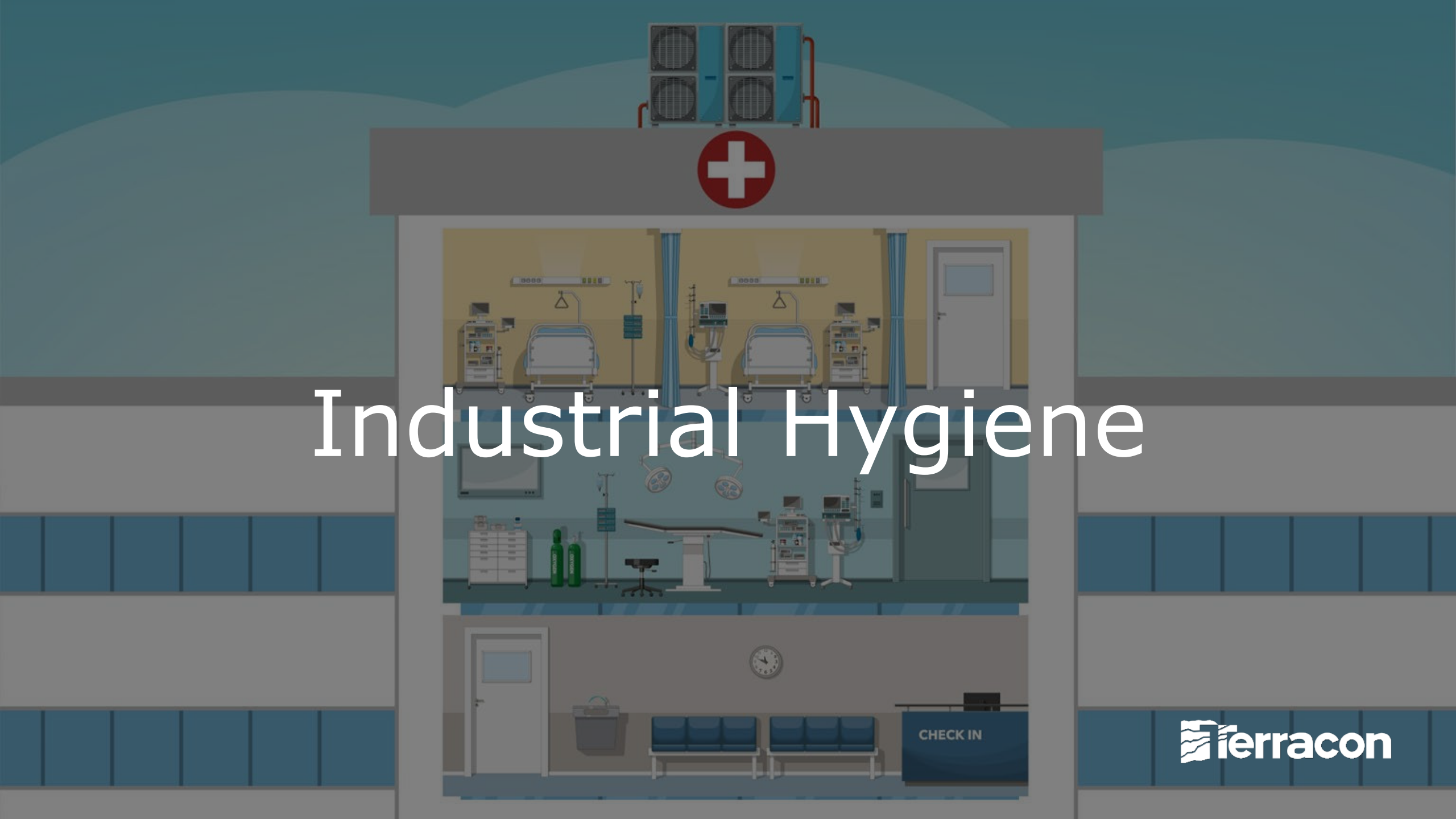
Operations

How often do poor pavement conditions negatively affect productivity at your facility?

Using Data To Help Budget A Plan

Maricopa Community College District - Pavement Maintenance Program





The background is a stylized illustration of a hospital building. The roof features four air conditioning units and a prominent red circle with a white cross. A central cutaway reveals the interior, showing two patient rooms with beds and monitors, a surgical suite with an operating table and lights, and a waiting area with blue chairs and a 'CHECK IN' desk. The building has multiple windows with blue frames.

Industrial Hygiene

Infection Control, Patient Welfare, & Worker Health

- Hazardous Drugs
- Waste Anesthetic Gases (WAG)
- Infectious Agents (i.e., biohazards)
- ANSI/AAMI ST108 & Water Management
- Construction Activities





Legionella



Waste Anesthetic
Gas Exposure



Indoor Environmental
Quality & Infection Control

Occupational Exposures

- Hazardous Drugs & Disinfectants
- Waste Anesthetic Gases (WAG)
- Infectious Agents (i.e., biohazards)
- Radiation
- Physical Hazards



Hazardous Drugs & Decontamination

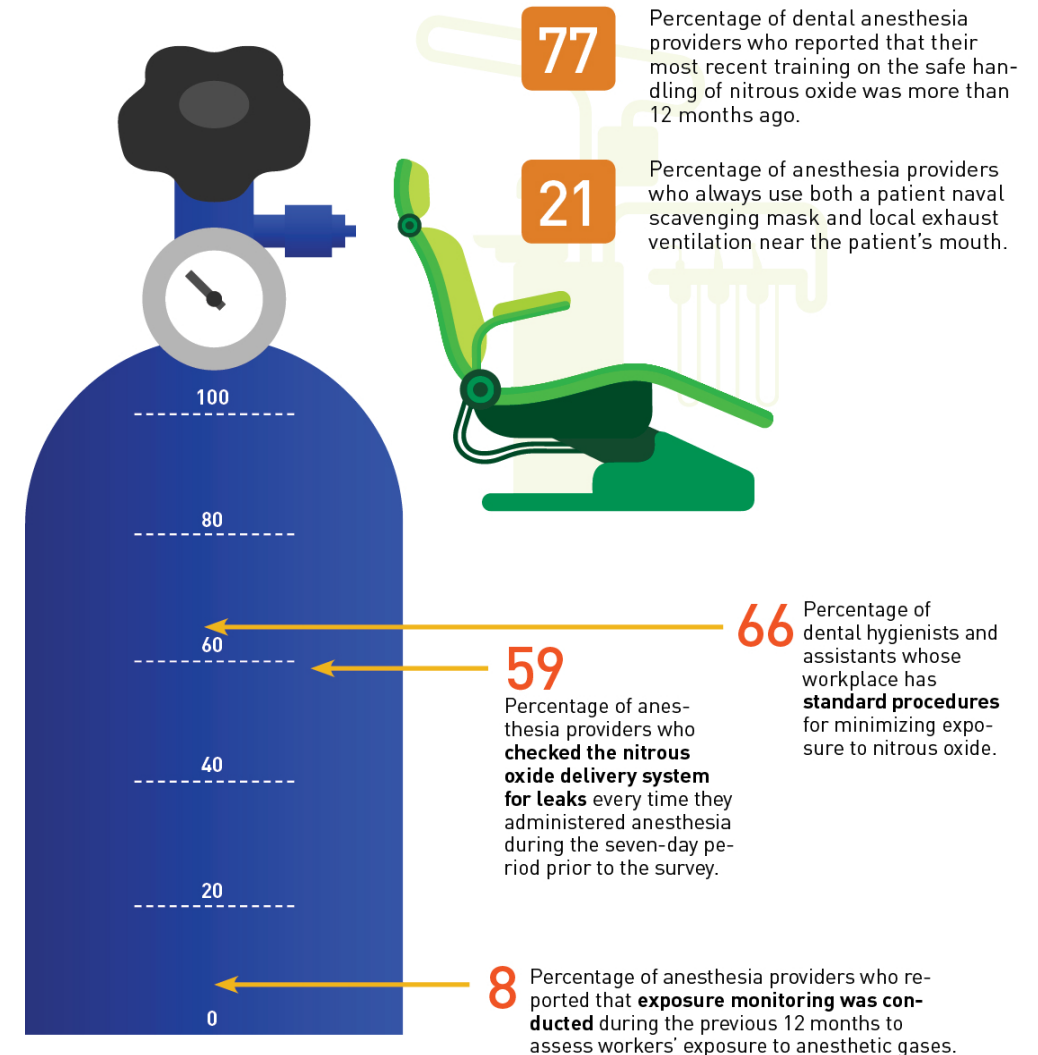
- Assessment of Risk (AOR)
 - ✓ Type of Hazardous Drug (NIOSH Table) - Antineoplastic, non-antineoplastic, reproductive risk
 - ✓ Dosage Form
 - ✓ Risk of Exposure (IH)
 - ✓ Packaging
 - ✓ Manipulation
- USP 800

NIOSH List of Hazardous Drugs
in Healthcare Settings, 2024

	Purpose	How	Examples
Deactivation	Transform the HD into less hazardous light	Chemical, heat, UV light	EPA-registered oxidizers(e.g., peroxide formulations, sodium hypochlorite)
Decontamination	Removal of HD residue of exposed surfaces	Chemicals	Alcohol, water, peroxide, sodium hypochlorite
Cleaning	Removal of soil from surfaces/objects		Water, detergents
Disinfection	Inhibits or destroys microorganisms		Sterile alcohol

Waste Anesthetic Gases

- Nitrous Oxide
- Halogenated Agents
 - ✓ Isoflurane
 - ✓ Desflurane
 - ✓ Sevoflurane
- Operating rooms, PACU, dental offices, veterinary clinics
- Engineering Controls: scavenging systems
- Health effects
 - ✓ Nausea, dizziness, headache, fatigue
 - ✓ Sterility, miscarriages, birth defects
 - ✓ Cancer
 - ✓ Liver and kidney disease



Source: AIHA, The Synergist, June 2017

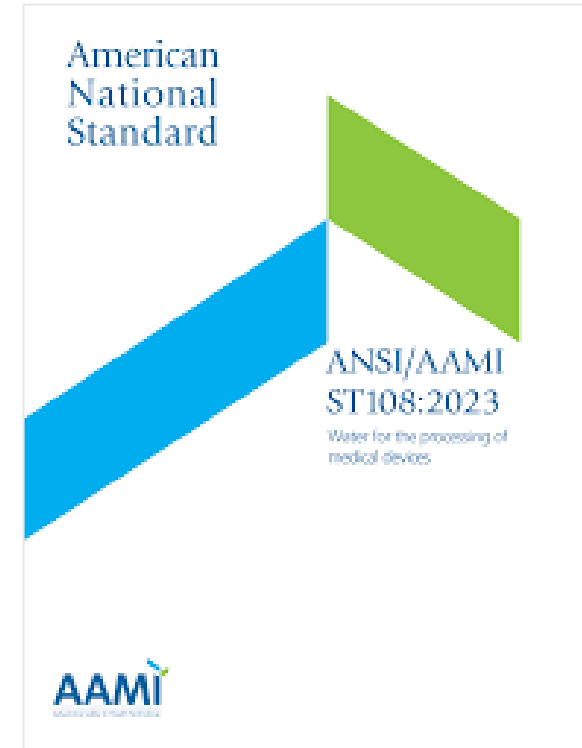
Infection Control & Patient Welfare

- ANSI/AAMI ST108
- *Legionella*
- Indoor & Outdoor Construction Activities
- Disaster Response



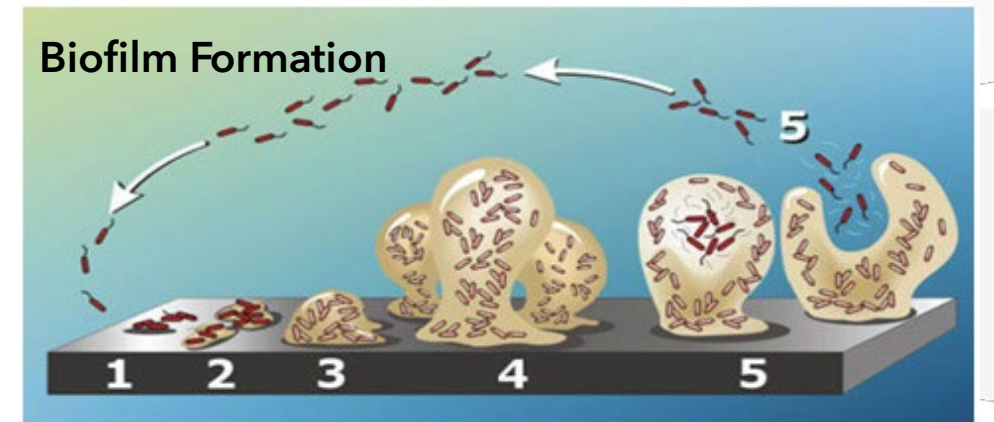
AAMI ST108:2023

- Water for the processing of medical devices
 - ✓ Establishes minimum requirements for the water quality used in instrument processing
 - ✓ Includes point-of-use, cleaning, rinsing, disinfection, and sterilization of instruments
- Categories of Water
 - ✓ Utility Water
 - ✓ Critical Water
 - ✓ Steam
- Testing Requirements
 - ✓ pH, Conductivity, Alkalinity, Hardness
 - ✓ Bacteria
 - ✓ Endotoxin
 - ✓ Color & Turbidity



Legionella pneumophila

- Gram-negative rod-shaped bacterium
- Lives in fresh water (rivers, lakes, streams, municipal water)
- *Legionella* grow in sludge, scale, organic matter, and biofilm in water systems
 - ✓ Especially in stagnant water, low flow regimes, and dead legs
- Ideal temperature for growth, 80-110° F
- Temperatures above 145° F kill *Legionella*



Renovation & Demolition

- Asbestos & Hazardous Building Materials
- Mold & Microbial Pathogens
 - ✓ Mold is ubiquitous
 - ✓ Dust is a vehicle for mold spores
- Dust Control
- Water Intrusion/Damage
- Indoor Air Quality
- Disaster Response
- Noise



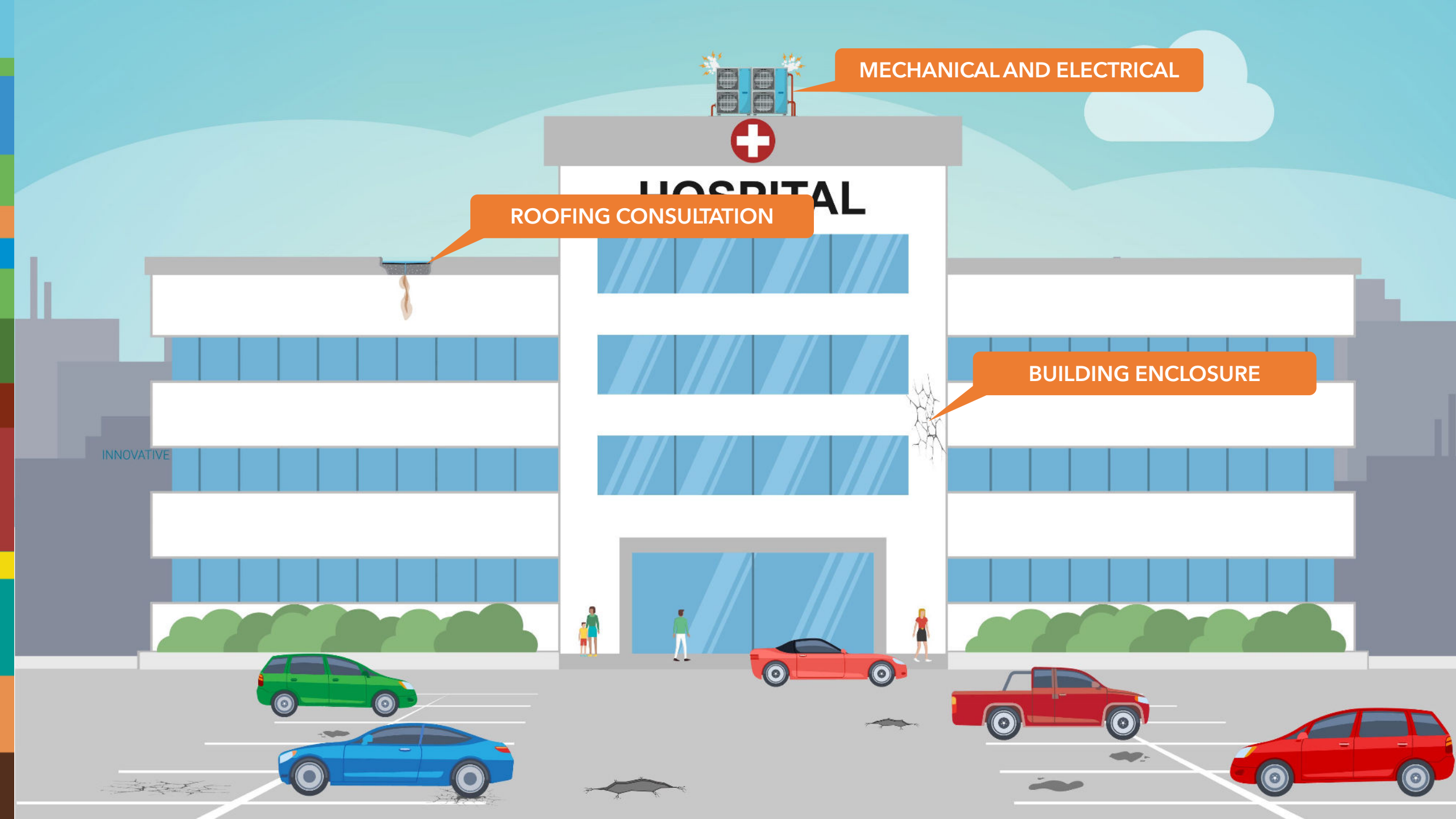


HOSPITAL

Facilities Services



Buildings Can Get Sick.



MECHANICAL AND ELECTRICAL

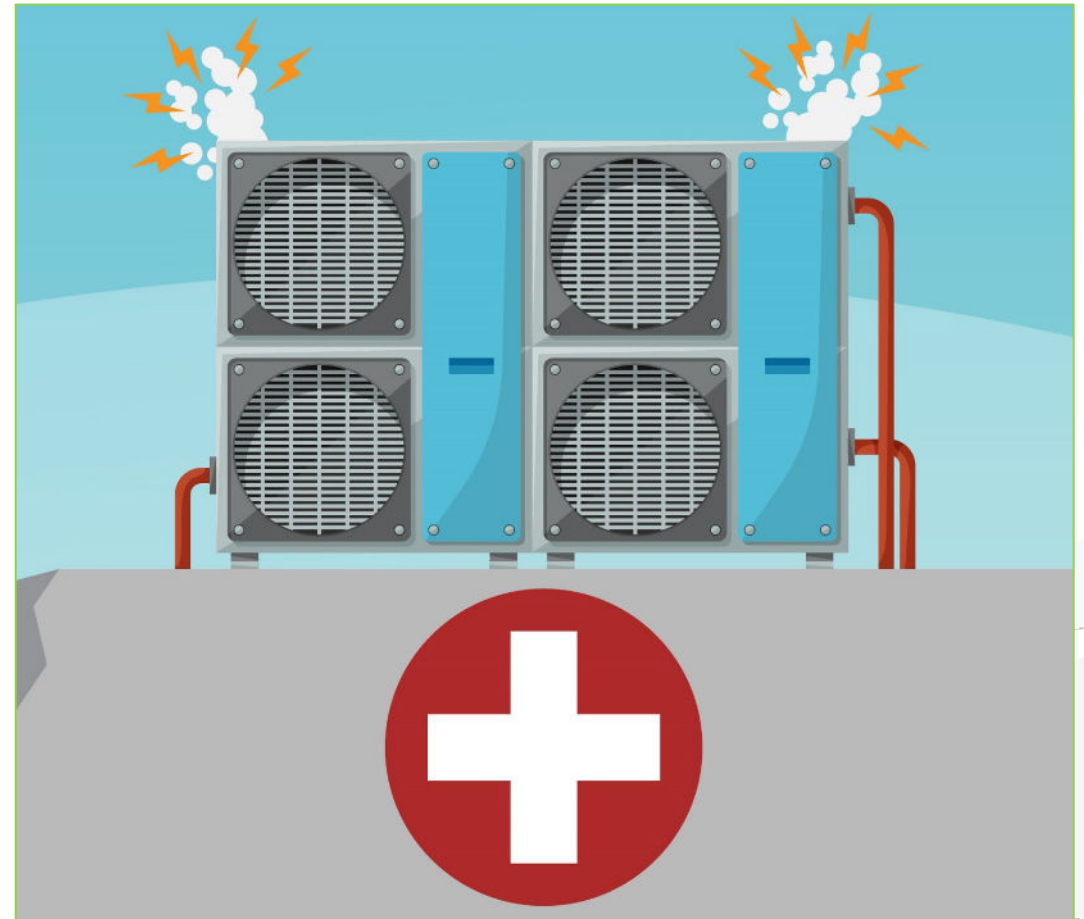
ROOFING CONSULTATION

BUILDING ENCLOSURE

INNOVATIVE

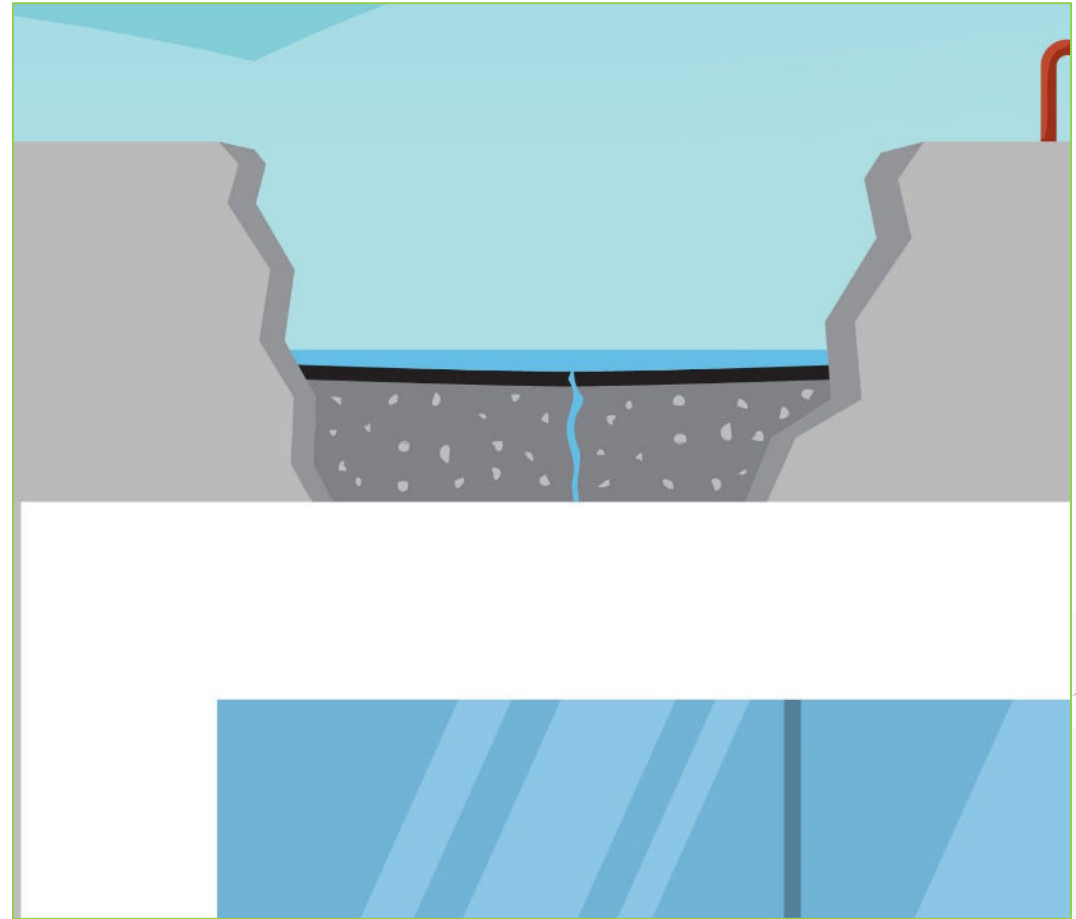
Mechanical and Electrical

- System Performance Criteria
 - ✓ Changes in Usage
 - ✓ Maintenance
 - ✓ Filtration
 - ✓ Energy Conservation
 - ✓ Lighting
- Cx/RCx
 - ✓ Set/Reset Performance Criteria
 - ✓ Enhance Service Life
 - ✓ Conserve Energy
 - ✓ Improve Occupant Comfort



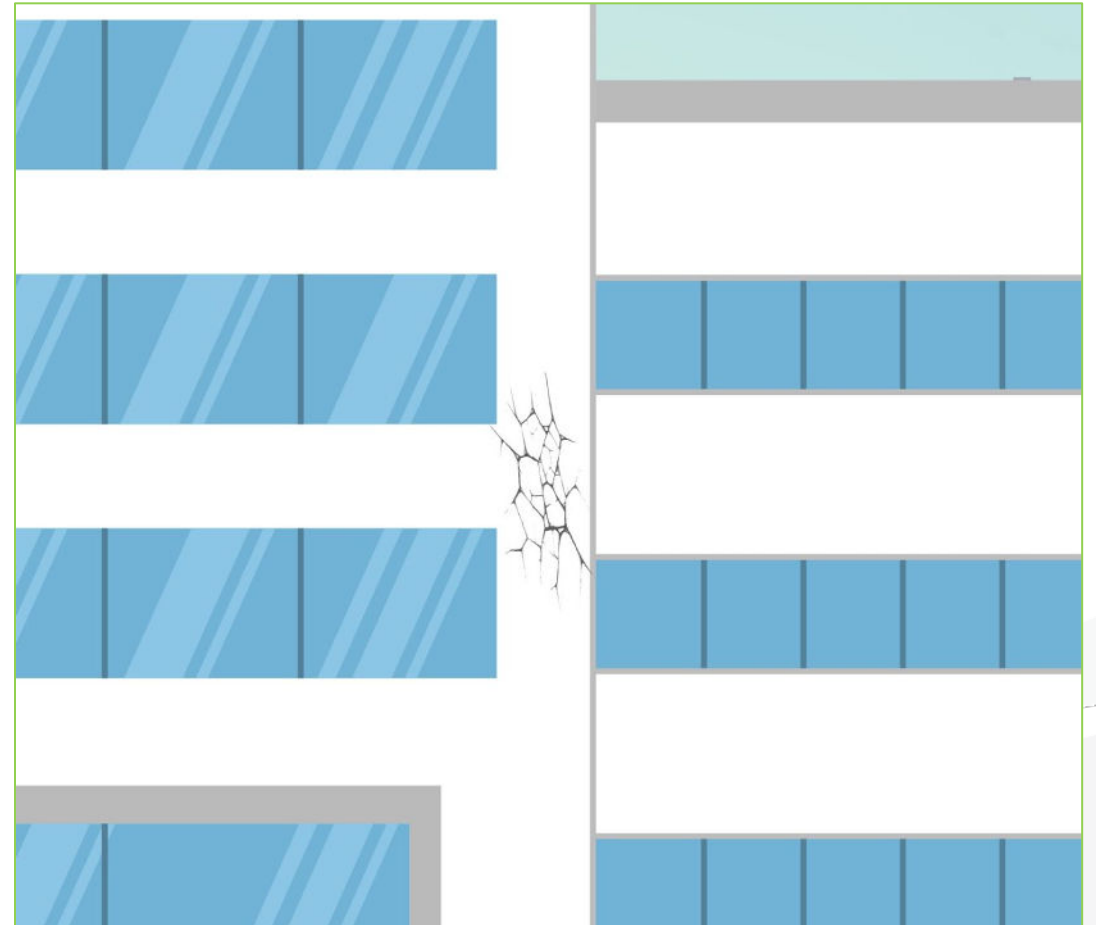
Roofing

- Age and Condition
 - ✓ Weather
 - ✓ Traffic Damage
 - ✓ Other Systems (HVAC, etc)
 - ✓ Maintenance
- Transitions
 - ✓ Penetrations
 - ✓ Roof to Wall
 - ✓ Parapets



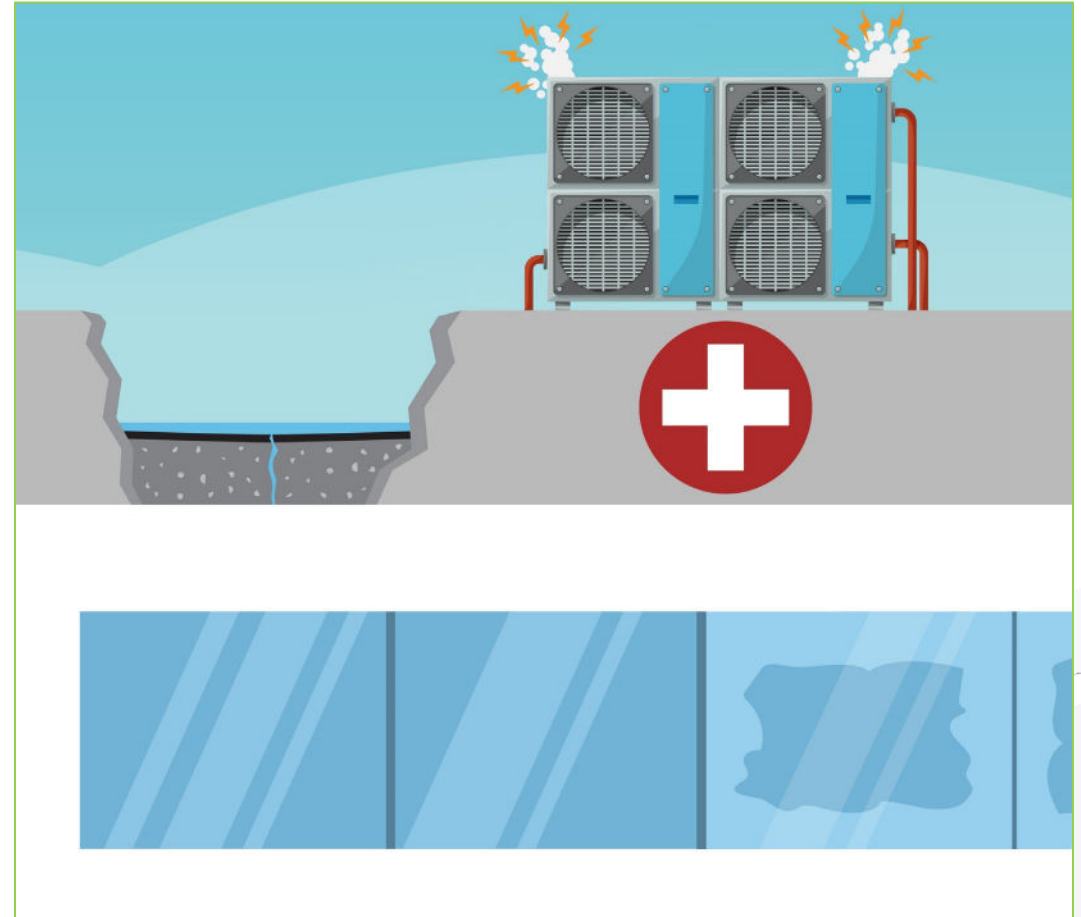
Building Enclosure

- Water Infiltration
 - ✓ Windows
 - ✓ Curtain Walls
 - ✓ Doors
 - ✓ Balconies
 - ✓ Below Grade
- Energy Loss
 - ✓ Air Gaps
 - ✓ Insulation
- Parking Garage



Diagnose and Cure Building Conditions

- Review case histories
- Visual exams
- Run some tests
- Use some fancy instruments
- Design corrective action plans
- Conduct surgeries
- Repair the problems and check the fix



Resiliency

- Property Risk Assessment (PRA) - ASTM E3429-24
 - ✓ Identify hazards and their potential impact
 - ✓ Develop plans to mitigate the impacts and enhance resilience
 - ✓ Improve planning regarding investment, management and insurance
 - ✓ Enhance overall regulatory compliance
- Three Stages of a PRA
 1. Identify the hazards
 2. Evaluate risks from those hazards
 3. Identify conceptual resilience measures

Know What You Own

- Understanding System Condition
 - ✓ Anticipated Service Life
 - ✓ Restore vs. Replace Options
 - ✓ Realistic Budget Planning
 - ✓ Forecast of Action
- Condition Assessment
 - ✓ Facility Wide
 - ✓ System Specific
 - ✓ Identify Options
- The Result and Opportunity
 - ✓ Facilitates Confidence in Planning
 - ✓ Validation of Need to C-Suite
 - ✓ Repeatable Process

Questions