SESSION OBJECTIVES

1. ANALYZE existing building infrastructure and identify renewal needs

2. APPLY a risk management framework to prioritize infrastructure investments

3. TRANSLATE facility capital needs into a language that C-level and board members understand
CURRENT BUILDING INFRASTRUCTURE
**BAYCREST – HISTORY**

- **1918**
  - The Toronto Jewish Old Folks Home opens on Cecil Street in downtown Toronto.

- **1959**
  - Baycrest's Day Care Services for Seniors welcomes its first participants.

- **1968**
  - The Baycrest Terraces, a state-of-the-art assisted living residence opens.

- **1976**
  - The new 300-bed Baycrest Hospital opens, becoming the first chronic care hospital to incorporate short-term services.

- **1986**
  - Baycrest establishes The Rotman Research Institute, the top brain health research facility in the world.

- **1989**
  - The Abe and Elsie Posluns Building opens providing private and semi-private rooms. The hospital occupies four floors.

- **1990**
  - Baycrest becomes affiliated as an academic centre of the University of Toronto.

- **2000**
  - The Apotex Centre Nursing Home is launched to care for older adults, the majority of whom suffer from some form of cognitive impairment.
Established in 1918
Headquartered on a 22-acre campus in Toronto, Canada
Serves up to 1,500 older adults per day
Wide range of wellness programs and community services

Fully affiliated with the University of Toronto
World’s top research institute in cognitive neuroscience
Provides training for 1,500 students per year

472-bed nursing home
262-bed complex continuing care and rehabilitation hospital
190-suite assisted living facility
120-suite independent living facility
BAYCREST – CHALLENGES

1. AGED FACILITY, WITH MINIMAL INFRASTRUCTURE INVESTMENT POST REDEVELOPMENT

2. CAPITAL FUNDING LIMITATIONS

3. ENERGY PROGRAM ADDRESSED BOILERS AND CHILLERS, BUT LITTLE DONE BEYOND THAT
FCAP ASSESSMENT

FACILITY
CONDITION
INDEX

FCI BY BUILDING

Wagman  Terraces  Posluns  BHC  Hospital  Apotex

MOHLTC Target
ONTARIO HOSPITAL INFRASTRUCTURE

PROVINCIAL LANDSCAPE

AGE OF FCAP ELIGIBLE HOSPITAL ASSETS BY SQUARE FOOTAGE

Source: MOHLTC Capital Branch, 2010
TRADITIONAL APPROACH
## RISK DETERMINATION

### A SUMMARY CHART OF TRADITIONAL INFRASTRUCTURE RENEWAL NEEDS

<table>
<thead>
<tr>
<th>Category</th>
<th>Requirement</th>
<th>System</th>
<th>Requirement</th>
<th>Requirement</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beyond Useful Life</td>
<td>Emergency Diesel Generator - Beyond Useful Life</td>
<td>1 - Health and Life Safety</td>
<td>D5092 - Emergency Light and Power Systems</td>
<td>Jan 30, 2016</td>
<td>604,850</td>
</tr>
</tbody>
</table>

Source: VFA, Inc., 2016
RISK DETERMINATION

VS
NEW APPROACH
WSP | MMM GROUP PERFORMED A BUILDING CONDITION ASSESSMENT OF THE BAYCREST CAMPUS
SCOPE

ASSESSED FEATURES OF BUILDING SYSTEMS:

BUILDING ENVELOPE
› Building Enclosure
   › Shell
   › Cladding
   › Windows
   › Doors
   › Sealant
› Roof
   › Surfacing
   › Membrane (where exposed)
   › Transitions
   › Flashing

MECHANICAL SYSTEMS
› HVAC
› BAS
› Fire Prevention Systems
› Plumbing
   › Building Supply
   › Heating & Cooling
   › Distribution
   › Drainage

ELECTRICAL SYSTEMS
› Fire Alarm System
› Building Supply
› Distribution
› Heating
› Communication
› Emergency Power
METHODOLOGY & RESOURCES

- SITE OBSERVATIONS
- REVIEW EXISTING DRAWINGS
- REVIEW EXISTING FACILITY REPORTS

- CONVERSATIONS WITH OPERATIONS & MAINTENANCE PERSONNEL
- COMPARISON AGAINST RELEVANT CODES & STANDARDS FOR HEALTHCARE FACILITIES
RISK DETERMINATION

POTENTIAL SOLUTION:

› In lieu of a traditional presentation of infrastructure needs, a risk based approach was used

› The risk model used was adopted from HIROC: Health Insurance Reciprocal of Canada

› Uses same risk analysis that is used in clinical environment

› Comparison of dissimilar risks/issues

GOAL:
Instead of discussing pumps and fans, we can talk risk. This levels the playing field and brings the discussion into a language that C-levels understand.
## HIROC RISK FRAMEWORK

### PROBABILITY SCALE:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rare occurrence</td>
<td>VERY LOW</td>
<td>LOW</td>
<td>MEDIUM</td>
<td>HIGH</td>
<td>VERY HIGH</td>
</tr>
<tr>
<td>e.g. once in 10 or more years</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Unlikely occurrence</td>
<td>LOW</td>
<td>MEDIUM</td>
<td>HIGH</td>
<td>VERY HIGH</td>
<td></td>
</tr>
<tr>
<td>e.g. once every 5-10 years</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Occasional occurrence</td>
<td>MEDIUM</td>
<td>HIGH</td>
<td>VERY HIGH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e.g. every 1-5 years</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Likely occurrence</td>
<td>HIGH</td>
<td>VERY HIGH</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e.g. every 6 months</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Common occurrence</td>
<td>VERY HIGH</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e.g. every 1-6 months</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
### HIROC RISK FRAMEWORK

#### IMPACTSCALE:

**PATIENT / RESEARCH SUBJECT**
- Harm from care, environment, others (e.g., assault)

**STAFF / VISITOR**
- Harm from environment, others (e.g., assault)

**FINANCIAL**
- Increase in expenses or loss of revenue

**BUSINESS OR SERVICE INTERRUPTION**
- Loss/interruption of 1-8 hours
- Loss/interruption of 8-24 hours
- Loss/interruption of 1-7 days
- Loss/interruption of >1 week
- Permanent loss of service or facility

**STANDARDS COMPLIANCE**
- Minor noncompliance
- Loss/interruption of 1-8 hours
- Loss/interruption of 8-24 hours
- Loss/interruption of 1-7 days
- Loss/interruption of >1 week

**STAFFING / ORGANIZATIONAL DEVELOPMENT**
- Shortage of key staff that reduces service levels or competence

**ADVERSE PUBLICITY / REPUTATION**
- Rumours
- Potential for public concern

### PATIENT / RESEARCH SUBJECT

#### FINANCIAL
- Increase in expenses or loss of revenue

#### BUSINESS OR SERVICE INTERRUPTION

1. Loss/interruption of 1-8 hours
2. Loss/interruption of 8-24 hours
3. Loss/interruption of 1-7 days
4. Loss/interruption of >1 week
5. Permanent loss of service or facility

---

### HIROC RISK FRAMEWORK IMPACT SCALE:

**1**
- Loss/interruption of 1-8 hours
- Minor injury or illness
- No increased length of stay
- No or minimal treatment
- Minor intervention (e.g., first aid)

**2**
- Loss/interruption of 8-24 hours
- Mild injury or illness
- No increased length of stay
- No or minimal treatment
- Minor intervention (e.g., minor medical care)

**3**
- Loss/interruption of 1-7 days
- Moderate injury or illness
- No or minimal treatment
- Minor intervention (e.g., minor medical care, minor medical treatment)

**4**
- Loss/interruption of >1 week
- Severe injury or illness
- Increased length of stay
- Moderate intervention (e.g., significant medical treatment, discharge to facility)

**5**
- Permanent loss of service or facility
- Catastrophic injury leading to death or permanent disability
- Catastrophic financial loss
- Very low staff morale
- Sustained negative media coverage

---

**Public inquiry**
- Medium-term reduction in public confidence
- Sustained reduction in public confidence

**Government involvement/supervisor**
- Ongoing unsafe staffing levels or competence
- Loss of several key staff

**Criminal code violation**
- Gross failure to meet standards
- Maximum fines
- Criminal code violation
- Impact on affiliation agreements

**Catastrophic financial loss**
- >$5M
- >5% of budget
- Permanent loss of service or facility

**Catastrophic injury leading to death or permanent disability**
- Semi-permanent disability
- >14 days
- Catastrophic injury leading to death or permanent disability
- >2% - 5% of budget

**Catastrophic financial loss**
- >$5M
- >5% of budget
- Permanent loss of service or facility
- >14 days
- Catastrophic financial loss
- >5% of budget

**Very low staff morale**
- Permanent loss of service or facility
- >14 days
- Catastrophic financial loss
- >5% of budget

**Sustained negative media coverage**
- Medium-term reduction in public confidence
- Sustained reduction in public confidence

**Ongoing unsafe staffing levels or competence**
- Loss of several key staff
- >80% of budget
- Severe injury or illness
- Increased length of stay
- Major intervention (e.g., significant medical treatment, discharge to facility)

**Major injury requiring major medical care**
- Catastrophic financial loss
- >5% of budget
- Permanent loss of service or facility
- >14 days
- Catastrophic injury leading to death or permanent disability
- >2% - 5% of budget

**Major financial loss**
- >1% of budget
- >1 week
- Major financial loss
- >1% of budget
- Major injury requiring major medical care (e.g., increase LOS by >14 days)

**Minor injury or illness**
- >1 week
- >1% of budget
- Major injury requiring major medical care (e.g., increase LOS by >14 days)
- >1% of budget
- Major injury requiring major medical care (e.g., increase LOS by >14 days)

**Severe injury or illness**
- >14 days
- >2% - 5% of budget
- Major injury requiring major medical care (e.g., increase LOS by >14 days)
- >1% of budget
- Major injury requiring major medical care (e.g., increase LOS by >14 days)

**Minor injury or illness**
- >1 week
- >1% of budget
- Major injury requiring major medical care (e.g., increase LOS by >14 days)
- >1% of budget
- Major injury requiring major medical care (e.g., increase LOS by >14 days)

**Severe injury or illness**
- >14 days
- >2% - 5% of budget
- Major injury requiring major medical care (e.g., increase LOS by >14 days)
- >1% of budget
- Major injury requiring major medical care (e.g., increase LOS by >14 days)

**Catastrophic injury leading to death or permanent disability**
- Semi-permanent disability
- >14 days
- Catastrophic injury leading to death or permanent disability
- >2% - 5% of budget
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**Catastrophic financial loss**
- >$5M
- >5% of budget
- Permanent loss of service or facility
- >14 days
- Catastrophic financial loss
- >5% of budget

**Permanent loss of service or facility**
- >14 days
- Catastrophic injury leading to death or permanent disability
- >2% - 5% of budget
- Catastrophic financial loss
- >5% of budget

**Semi-permanent disability**
- >14 days
- Catastrophic injury leading to death or permanent disability
- >2% - 5% of budget
- Catastrophic financial loss
- >5% of budget

**Major injury requiring major medical care**
- Catastrophic financial loss
- >5% of budget
- Permanent loss of service or facility
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- Catastrophic injury leading to death or permanent disability
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**Major injury requiring major medical care**
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**Major injury requiring major medical care**
- Catastrophic financial loss
- >5% of budget
- Permanent loss of service or facility
- >14 days
- Catastrophic injury leading to death or permanent disability
- >2% - 5% of budget
RISK DETERMINATION

The infrastructure assessment captures the current condition of our building assets and usable remaining life.

The information was then used within the HIROC risk assessment matrix to develop a risk score and prioritization for renewal, looking specifically at:

- **Probability** – Age and condition of equipment determined the probability of a failure
- **Impact** – Potential consequences of an incident determined the impact

Probability and Impact assessments were conducted with:

- High risk being within a 5 year time frame
- Medium risk being within a 5 to 10 year time frame
- Low risk being beyond a 10 year time frame

All renewals were then given a risk score, and averaged by building system.
### RESULTS

1. **A RISK BASED DISCUSSION**

2. **HEAT MAP**

   Risk score was analyzed by system and building to develop a campus heat map of infrastructure renewal needs.

<table>
<thead>
<tr>
<th>SYSTEMS</th>
<th>BUILDING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hospital</td>
</tr>
<tr>
<td>Roofing</td>
<td></td>
</tr>
<tr>
<td>Cladding</td>
<td></td>
</tr>
<tr>
<td>Glazing and Entry Systems</td>
<td></td>
</tr>
<tr>
<td>Mechanical Plant - Boilers, Chillers</td>
<td></td>
</tr>
<tr>
<td>Air Handling Systems</td>
<td></td>
</tr>
<tr>
<td>Heating</td>
<td></td>
</tr>
<tr>
<td>Cooling</td>
<td></td>
</tr>
<tr>
<td>Pumps</td>
<td></td>
</tr>
<tr>
<td>Plumbing</td>
<td></td>
</tr>
<tr>
<td>Pressurization Fans</td>
<td></td>
</tr>
<tr>
<td>BAS/Controls</td>
<td></td>
</tr>
<tr>
<td>Normal Power</td>
<td></td>
</tr>
<tr>
<td>Emergency Power</td>
<td></td>
</tr>
<tr>
<td>Low Tension Systems</td>
<td></td>
</tr>
<tr>
<td>Fire Alarm System</td>
<td></td>
</tr>
</tbody>
</table>

- **HIGH RISKS**
- **MEDIUM RISKS**
- **LOW RISKS**
RISK DETERMINATION

HOW DO WE LEVERAGE THIS INFORMATION IN OTHER WAYS?

MASTER PLANNING

RENEWAL STRATEGIES
## IDENTIFIED RISKS

### EXAMPLES OF TOP RISK AREAS:

<table>
<thead>
<tr>
<th>RISK</th>
<th>CONDITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Generation and Distribution</td>
<td>Generator and distribution equipment is original to the building and has significant signs of aging. The emergency generators do not detect failure in only one phase, and creates situations where portions of the hospital are out of power during partial power disruption.</td>
</tr>
<tr>
<td>Heating, Cooling and Ventilation</td>
<td>Aged and antiquated HVAC equipment identified within the Posluns, BHC, Terraces and Wagman facilities.</td>
</tr>
<tr>
<td>Glazing and Entry Systems</td>
<td>Several of the key egress doors show significant sign of rust/aging.</td>
</tr>
<tr>
<td>Pressurization Fans</td>
<td>Fans have reached the end of useful life.</td>
</tr>
<tr>
<td>Sump Pump Systems</td>
<td>Sump Pumps are at the end of useful life and failing on a regular basis.</td>
</tr>
<tr>
<td>Power Distribution Terraces and</td>
<td>Power distribution is in a location susceptible to flooding.</td>
</tr>
<tr>
<td>Wagman</td>
<td></td>
</tr>
<tr>
<td>Roofing</td>
<td>Roofs within the older parts of the facility require replacement (Posluns, BHC, Terraces and Wagman). Signs of aging and leaks are evident.</td>
</tr>
</tbody>
</table>
### IDENTIFIED RISKS

#### EXAMPLES OF MEDIUM RISK AREAS:

<table>
<thead>
<tr>
<th>RISK</th>
<th>CONDITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Panels</td>
<td>Lighting panels throughout Posluns, BHC, and Hospital are either aged and/or obsolete, with the majority installed in the 1950s, 1960s, and 1980s respectively. Replacement parts are not available as vendor no longer exists.</td>
</tr>
<tr>
<td>Roofing</td>
<td>Roofs within Hospital will require replacement in a 5 to 10 year time frame as they are reaching the end of useful life.</td>
</tr>
<tr>
<td>Plumbing Systems</td>
<td>Plumbing systems within Posluns and BHC are beyond useful life and have evidence of pinhole leaks is developing.</td>
</tr>
<tr>
<td>Glazing Systems</td>
<td>Windows within the Hospital have signs of aging and will be approaching the end of useful life in 5 to 10 years.</td>
</tr>
</tbody>
</table>
WSP | MMM GROUP IDENTIFIED OVER $100M IN INFRASTRUCTURE RENEWAL NEEDS IN THE HIGH, MEDIUM AND LOW RISK CATEGORIES

<table>
<thead>
<tr>
<th>RISK LEVEL</th>
<th>TOTAL COSTS</th>
<th>RENEWAL TIMEFRAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>$25,990,388</td>
<td>&lt; 5 Years</td>
</tr>
<tr>
<td>Medium</td>
<td>$48,643,429</td>
<td>5 to 10 Years</td>
</tr>
<tr>
<td>Low</td>
<td>$25,628,970</td>
<td>&gt; 10 Years</td>
</tr>
</tbody>
</table>
# Asset Findings | Baycrest Hospital

**Year Constructed:** 1985

**HIRF Qualified:** Yes

**FCI:** 0.22

**Square Footage:** 350,000 sq. ft.

## Asset Findings

<table>
<thead>
<tr>
<th>Risk Level</th>
<th>Required Investment</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>$10,910,453</td>
</tr>
<tr>
<td>Medium</td>
<td>$21,306,544</td>
</tr>
<tr>
<td>Low</td>
<td>$7,293,000</td>
</tr>
</tbody>
</table>

## Systems at Risk Condition Costs

<table>
<thead>
<tr>
<th>Systems at Risk</th>
<th>Condition</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency Power Generation and Distribution</td>
<td>Original to building, aged and not coordinated or in parallel to Apotex generator</td>
<td>$6,000,000</td>
</tr>
<tr>
<td>Glazing and Entry Systems</td>
<td>Several of the key egress doors show significant sign of rust/aging</td>
<td>$50,000</td>
</tr>
<tr>
<td>Nurse Call System</td>
<td>Obsolete nurse call system is failing on numerous floors</td>
<td>$5,467,000</td>
</tr>
<tr>
<td>Sump Pump Systems</td>
<td>Sump Pumps are at the end of useful life and failing on a regular basis</td>
<td>$60,000</td>
</tr>
<tr>
<td>Building Control Systems</td>
<td>BAS is original installation and does not provide controls that meet present CSA standards</td>
<td>$1,100,000</td>
</tr>
</tbody>
</table>
## ASSET FINDINGS | POSLUNS BUILDING

<table>
<thead>
<tr>
<th>RISK LEVEL</th>
<th>REQUIRED INVESTMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>$1,359,837</td>
</tr>
<tr>
<td>Medium</td>
<td>$2,843,635</td>
</tr>
<tr>
<td>Low</td>
<td>$2,095,961</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SYSTEMS AT RISK</th>
<th>CONDITION</th>
<th>COSTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kitchen Ventilation</td>
<td>System inadequate for production kitchen</td>
<td>$48,000</td>
</tr>
<tr>
<td>Kitchen Refrigeration System</td>
<td>In poor condition and not reliable</td>
<td>$528,000</td>
</tr>
<tr>
<td>Roofing – Upper</td>
<td>Significant water retention observed</td>
<td>$155,000</td>
</tr>
<tr>
<td>Roofing – West</td>
<td>Vintage with some areas unfinished</td>
<td>$42,000</td>
</tr>
<tr>
<td>Cladding – Masonry</td>
<td>Mortar erosion observed at brick</td>
<td>$256,000</td>
</tr>
<tr>
<td></td>
<td>Significant deterioration</td>
<td></td>
</tr>
</tbody>
</table>

- **Year Constructed:** 1954
- **HIRF Qualified:** Yes
- **FCI:** 0.35
- **Square Footage:** 123,000 sq. ft.
FIVE YEAR CAPITAL PLAN
CONSIDERATIONS

POTENTIAL SOURCES OF FUNDS FOR INFRASTRUCTURE RENEWAL:

1. HEALTHCARE INFRASTRUCTURE RENEWAL FUND (HIRF) ANNUAL GRANTS
   - Baycrest received $1.5M in HIRF funding for fiscal 2014/15
   - It is anticipated that the grant funding will be of similar level for the next 2 fiscal years
   - Only the Hospital, BHC, and Posluns buildings qualify for this funding

2. MOHLTC CAPITAL FUNDING
   - Only the Hospital, BHC, and Posluns buildings qualify for this funding
   - 10% local match is required

3. BAYCREST CENTRE CAPITAL
   - No significant external/Ministry funding sources available for Apotex, Terraces and Wagman
   - HIRF funds may not cover the entire needs of the Hospital, BHC, and Posluns, and additional capital funding will be required
NEXT STEPS

THE RISK BASED APPROACH ALLOWED FOR A DISCUSSION ON ADDRESSING HIGH PRIORITY RISKS...

USED TO MAKE SUBMISSIONS TO THE MOH FOR ADDITIONAL CAPITAL

INFORMED FCAP PROGRAM AND INCREASED HIRF GRANT BY 200%
THANK YOU