



# When Repairs And Renewals Are Not Enough

Cally Lo

Infrastructure Ontario

# Agenda

- ▶ Infrastructure Ontario
- ▶ Asset Renewal Management (ARM)/Lifecycle Asset Management Planning (LAMP)
- ▶ Building Operational Success & Building Needs
- ▶ What is Functional Deficiency?
- ▶ Implementation
- ▶ Summary





# Infrastructure Ontario's mandate

Creating a connected, modern, and competitive Ontario

Infrastructure Ontario is a Crown agency of the Province of Ontario that supports the government's initiatives to modernize and maximize the value of public infrastructure and real estate.

IO's mandate is determined by the provincial government and the agency is accountable to the Ministry of Infrastructure.



# General Real Estate Portfolio

IO is responsible for management of the General Real Estate Portfolio (GREP), comprised of nearly 4,400 government-owned facilities and one million acres of provincial land.



Real Estate  
Services

**4,350**

Government-owned facilities

**1 million**

Acres of land

**43 million**

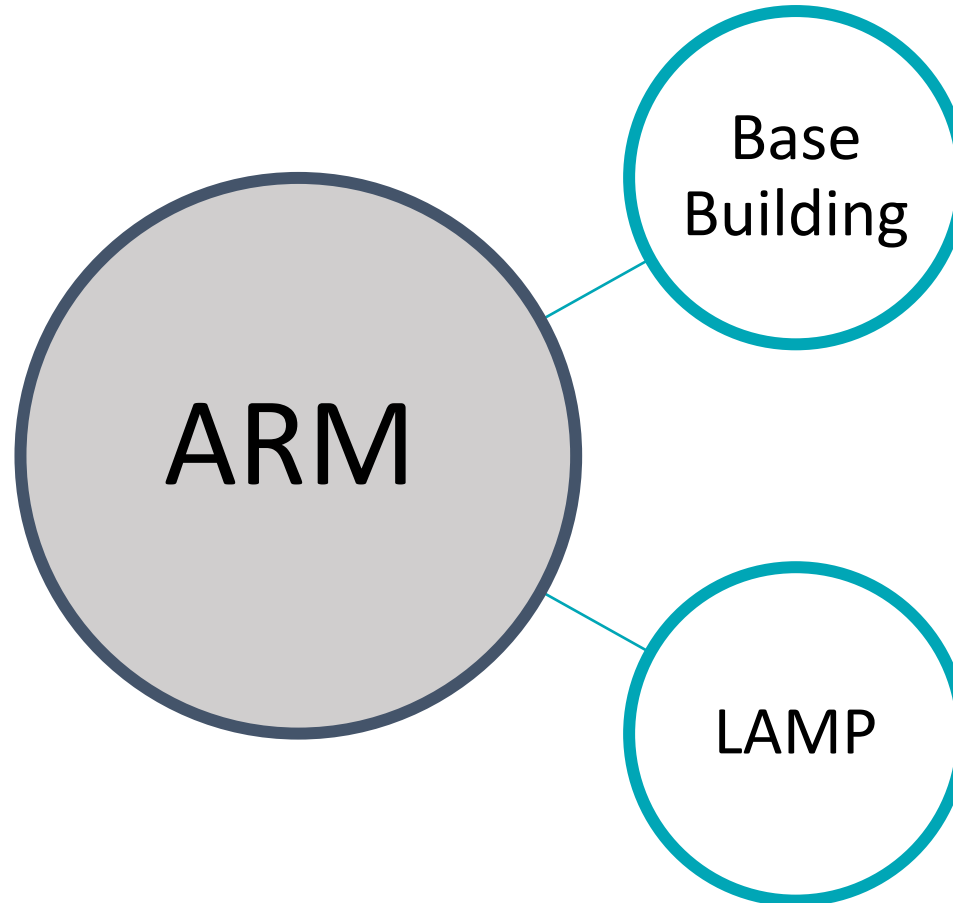
Rentable square feet of  
office and facility space

**84%**

Special purpose buildings, e.g.,  
courthouses and laboratories.

# Asset Renewal Management (ARM)

**Purpose:** Collect **evidence-based data** to produce condition performance metrics, which are combined to inform the **development of budget submissions** and a pipeline of priority-ranked repair and lifecycle renewal **project requirements**.



- GREP-owned, IO-managed inventory

- Other Ministries, agencies and BPS
- Fee for service



# Lifecycle Asset Management Planning (LAMP)

**Fee for service** program that supports Ministries, Agencies and Broader Public clients by leveraging IO's base-building reinvestment **methodologies, processes, resources, and tools** for application with customer client leasehold improvements (LHI) and associated building components, for which the client has responsibility/ownership.

## CLIENTS

- ▶ Ministry of Solicitor General – Corrections
- ▶ Ministry of Solicitor General – Ontario Provincial Police (OPP)
- ▶ Ministry of Attorney General
- ▶ Ministry of Natural Resources & Forestry
- ▶ Ministry of Natural Resources & Forestry – Regional Operations Division (ROD)
- ▶ Ministry of Health – Public Health Ontario
- ▶ Ministry of Tourism, Culture and Sport
- ▶ Ministry of Public and Business Service Delivery
- ▶ Ministry of the Environment, Conservation and Parks

# Repair & Renewal

An Asset Renewal is a project requirement that is necessary to maintain building systems over the expected useful life of the building(s). These requirements are made up of a combination of the following:

- ▶ **Major Repair** – Repair activities, beyond corrective maintenance activities covered under O&M, required to maintain the pre-determined service potential of a building system for a given expected useful life span
- ▶ **Lifecycle Renewal** – Activities that rebuild or replace a building system at the end of their useful life, thereby extending its service potential beyond the original system, without adding capacity.

# Building Operational Success



Program Mission

## Building Functionality



## Building Condition

Physical Fitness







A building's performance state changes over time and is reflected by two different indicators: the **physical condition** state and the **functional** state



# Factors that Contribute to Functionality



## Occupant/User Requirements

As tenant requirements change, or the underlying designated mission changes, the building's capability to provide service to its users is affected.



## Regulatory/Code Compliance

As new building codes, regulations, or organizational policies take effect, the building must adapt to these changes.



## Technical Obsolescence

As new materials and technologies improve efficiency, maintainability, and overall building performance, existing building components become obsolete and have decreased capabilities to the new baseline.

# Ways to Achieve Operational Success

Building Need

Condition

Repair

Renewal

# Ways to Achieve Operational Success

Building Need

Condition

Functionality

Repair

Renewal

Absence

Design

# Ways to Achieve Operational Success

## Functionality

### Absence

Installation of a key system that is not currently present but required

### Design

Modification or replacement of a system to meet specific design requirements

# Functional Deficiency Example

**Functional Deficiency:**  
The inadequacy of a facility to fulfill its intended function

**IN - INMATE ACCOMMODATIONS**

---

|   |                          |
|---|--------------------------|
| <b>Interior Doors - C1020</b>   | <b>SYS-181</b>           |
| <b>IN - INMATE ACCOMMODATIONS IN - Security Grade Cell Doors - Single Doors</b> | <b>CRV: \$351,857.84</b> |

|                  |          |                        |                          |
|------------------|----------|------------------------|--------------------------|
| Current Age:     | 2 years  | LHI Rating:            | 5 - Nearly new condition |
| Exp. Use. Life:  | 50 years | Obs. Yrs. Rem:         | 50 years                 |
| Quantity:        | 34 Each  | Unit Cost:             | \$10,348.76              |
| Insp. Date:      | 11/2/16  | Inspector:             | ██████████               |
| Heritage System: | No       | System Responsibility: | Client                   |

**System Description:**  
The security grade cell doors in the facility are considered to be deficient according to MCSCS guidelines. All inmate living areas possessed barred cell doors. In order to abide to current security standards, the cells should possess 50mm solid metal doors with electronic locks in addition to Paracentric/Mogul locks. The cell doors should also include polycarbonate glazing with a minimum thickness of 3/4", surface mounted hinges, and a meal hatch with a Paracentric/Mogul lock and a maximum opening rotation of 90 degrees.

**Requirements:**


REQ-156

**IN - Security Grade Cell Doors - Security Grade Cell Door - Deficiency**

|  |                  |
|--|------------------|
| Action Date: 8/10/18   | Cost: \$275,554  |
| Prime Sys: Interior Doors  | Status: Open     |
| Maint. Code: Proposed  | Finish Date:     |
| Priority: 52-Key Security Deficiency   | Actual Cost: \$0 |
| Action: IN - Security Grade Cell Doors - Security Grade Cell Door - Deficiency |                  |

**Description:**  
The Inmate Living Areas units currently possess single bar doors. The cell doors are not compliant to the current security standards, which indicate that all cell doors require 50mm solid metal door. This is required for each individual cell within each cell block. There are currently ████ doors which possess this deficiency. This includes the doors in living areas ████

SYSTEM IMAGE  
NOT AVAILABLE





# Implementation – IO's Approach

**Determine  
Client Priorities**

**Collect source  
Documents**

**Translate  
deficiencies into  
observable  
criteria**

**Prioritize and  
identify key  
deficiencies**

**Integrate into  
assessments**

# Implementation - Initiatives

Collaborative

Modern

Enhance  
User  
Experience

Flexible

Sense of  
Community

\*sample concepts

Determine Client  
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Collect source  
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Translate  
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# Implementation - Inputs & Resources

- ▶ Planning Guidelines
- ▶ Health and Safety Standards
- ▶ Security Standards
- ▶ Design Specifications



Determine Client  
Priorities

Collect source  
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Translate  
deficiencies into  
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# Implementation – Observable Characteristics



## Design Criteria

- Loading dock is designed for access by the **largest trucks** used by the institution and fully enclosed/sheltered  **type** ? What size
- There is a dock leveller and/or scissor lift  **systems**
- Exterior doors have **high performance, pest-proof seals.** ? define
- ~~There are no garbage bins or dumpsters inside the loading dock~~ ? Not design related
- Motion detectors and CCTVs are installed in interior receiving areas ? quantify
- There are door contact sensors on exterior and garage doors.  **systems**
- Interior space is heated in winter  **systems**

Determine Client  
Priorities

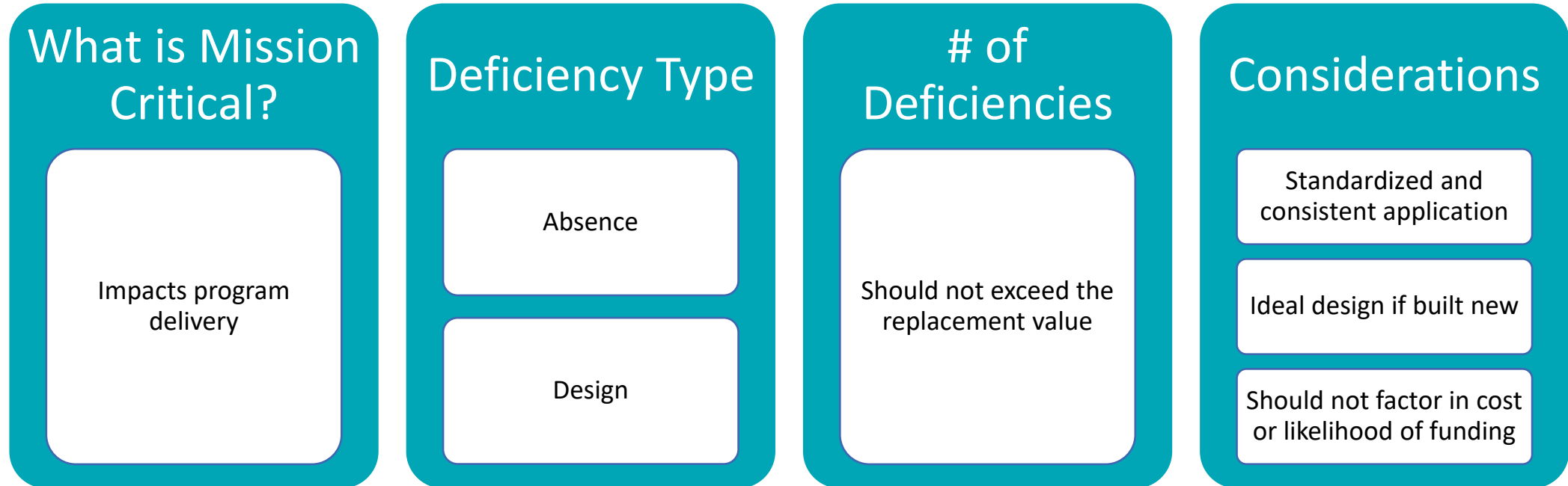
Collect source  
Documents

Translate  
deficiencies into  
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criteria

Prioritize and  
identify key  
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Integrate into  
assessments

# Implementation – What to Include



Determine Client Priorities

Collect source Documents

Translate deficiencies into observable criteria

Prioritize and identify key deficiencies

Integrate into assessments

# Implementation – IO's Approach

**Determine  
Client Priorities**

**Collect source  
Documents**

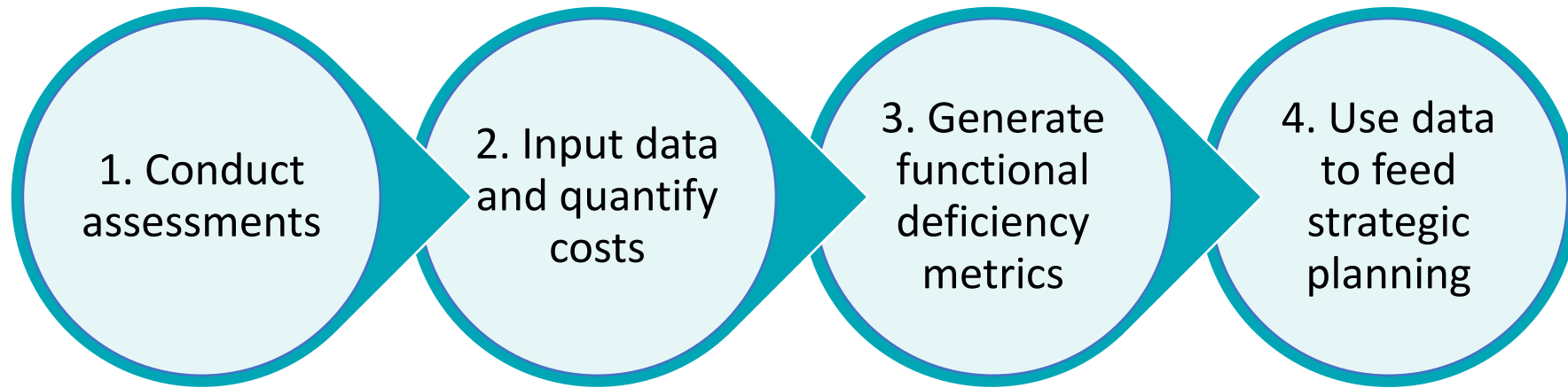
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# Implementation



Determine Client  
Priorities

Collect source  
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Translate  
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Prioritize and  
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Integrate into  
assessments

# Functional Deficiency Index (FDI)

The **Functional Deficiency Index (FDI)** speaks to the client's current specifications and standards.

**FDI =**

**Deficiency Requirements**

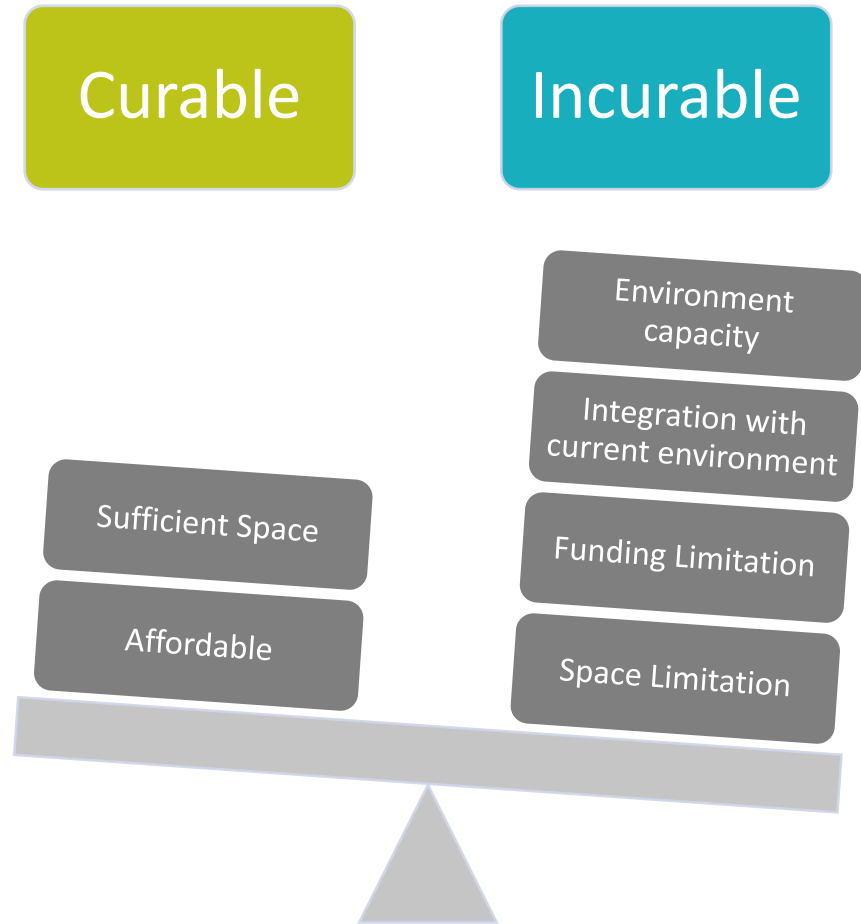
**Current Replacement Value**

\*Current Replacement Value refers to total value of systems that are the responsibility of the client

# Condition Vs. Functionality

| Asset      | Current Replacement Value | Condition                                      |        | Functionality |        |                                      |
|------------|---------------------------|--|--------|---------------|--------|--------------------------------------|
|            |                           | FCI Amount<br>(Current Year + Year 1 + Year 2) | FCI    | FDI Amount    | FDI    |                                      |
| Building A | \$8,966,831               | \$3,674,799                                    | 40.98% | \$3,292,548   | 36.72% | Poor condition<br>Poor functionality |
| Building B | \$8,352,520               | \$730,512                                      | 8.75%  | \$3,292,325   | 39.42% | Good condition<br>Poor functionality |
| Building C | \$33,206,387              | \$10,704,967                                   | 32.24% | \$2,445,254   | 7.36%  | Poor condition<br>Good functionality |
| Building D | \$17,143,818              | \$642,145                                      | 3.75%  | \$568,161     | 3.31%  | Good condition<br>Good functionality |

# Curable vs. Incurable



## Curable Deficiencies

- ▶ Effectively plan for the near future

## Incurable Deficiencies

- ▶ Effectively plan for alternate solutions for the future
  - Reinvest
  - Divest and Construct new

# Summary

- ▶ A building's performance state changes over time and is reflected by two different indicators: the physical condition state and the functional state. Planning and investment for **repairs, renewals and functional deficiencies** are required **to achieve building operational success**
- ▶ Functionality assessments fill a necessary gap to completely measure and describe **building performance**







# ASSET RENEWAL MANAGEMENT

Lifecycle Asset Management Planning (LAMP)

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Ontario**

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# template



# template



# Real estate portfolio

- The provincial real estate portfolio is one of Canada's largest and most diverse
- Realty is integral to the delivery of public services across Ontario
- IO is fully responsible for the General Real Estate Portfolio, which is comprised of:



**Nearly 4500 buildings and structures  
in communities across the province**



**More than 42 million rentable  
square feet**



**Nearly one million acres of  
land throughout the province**

- IO also delivers realty services to other provincial and broader public sector entities

|   | OPTIONS   | MAG implications/considerations   | LAMP implications/considerations   | OVERALL OUTCOME  |
|---|---|---|--|--|
| A | <p>BGIS to conduct functional assessments</p> <p>Functional deficiencies automatically inputted into VFA</p>  | <ul style="list-style-type: none"> <li>MAG to identify standardized functional deficiency items</li> <li>MAG to agree to standardized remedies to the deficiency and cost</li> </ul>  | <ul style="list-style-type: none"> <li>LAMP to assist in the standardization of the deficiency and costing</li> <li>BGIS to conduct functional deficiency assessment and input of data into VFA</li> </ul>   | <p><b>Highly Recommended</b></p> <ul style="list-style-type: none"> <li>High level of effort</li> <li>Clear indication of deficiencies and quantification of deficiencies</li> <li>Standardization and costing of deficiencies will be achieved with the support of LAMP and BGIS</li> <li>In line with MOI's expectations</li> <li>Requires time and resources (from MAG/LAMP) to workshop an agreed upon approach for deficiencies that may result in a later assessment start time</li> </ul> |
| B | <p>BGIS to take photos of predetermined items/systems (identified by MAG) for MAG's reference</p> <p>Functional deficiencies "manually" inputted into VFA (through MAG input)</p> | <ul style="list-style-type: none"> <li>MAG to identify and define what pictures are required</li> <li>MAG team to review pictures (independent of LAMP/BGIS) to identify functional gaps</li> <li>MAG to identify actions required and costing following a standardized template</li> </ul> | <ul style="list-style-type: none"> <li>BGIS to take photos and share in transfer folder to MAG</li> <li>No comments or costing will be recorded since assessment was not conducted by assessors</li> <li>BGIS will input deficiency actions and cost as provided from MAG</li> </ul> | <p><b>Moderately Recommended</b></p> <ul style="list-style-type: none"> <li>Lower level of up front effort by MAG (but required later)</li> <li>Will still require standardization and review by MAG team to identify deficiencies (completed internally)</li> <li>Recommendations/actions coming out of MAG's review can be incorporated into VFA by following a standardized template</li> <li>No QA checks will be conducted on functional deficiency action items by BGIS</li> </ul>         |
| C | <p>BGIS to take photos of predetermined items/systems (identified by MAG) for MAG's reference</p> <p>Functional deficiencies NOT inputted into VFA</p>                            | <ul style="list-style-type: none"> <li>MAG to identify and define what pictures are required (independent of LAMP/BGIS)</li> <li>Tracking deficiency gaps will be conducted by MAG internally</li> </ul>  | <ul style="list-style-type: none"> <li>BGIS to take photos and share in transfer folder to MAG</li> <li>No comments or costing will be recorded since assessment was not conducted by assessors</li> </ul>   | <p><b>Not Recommended</b></p> <ul style="list-style-type: none"> <li>Lower level of up front effort by MAG</li> <li>MAG to determine internal approach to determine and identify functional deficiencies</li> <li>No standardization of functional deficiencies, inconsistencies can occur</li> <li>Recommendations/actions coming out of MAG's review is captured outside of VFA</li> <li>VFA Reports, LACR, 10 Year Plan of Need will exclude functional deficiency costs</li> </ul>           |
| D | <p>No action required</p>   | <ul style="list-style-type: none"> <li>MAG team to determine functional deficiencies (independent of LAMP/BGIS)</li> <li>Tracking deficiency gaps will be conducted by MAG internally</li> </ul>  | <ul style="list-style-type: none"> <li>No action required from BGIS/LAMP</li> <li>No comments or costing will be recorded since assessment was not conducted by assessors</li> </ul>   | <p><b>Strongly Not Recommended</b></p> <ul style="list-style-type: none"> <li>Lowest level of effort by MAG</li> <li>No standardization of functional deficiencies, inconsistencies can occur</li> <li>No alignment to condition needs in VFA</li> <li>Does not impact start of assessments</li> </ul>   |

# Asset Renewal Management

- Asset Renewal Management at IO is a set of coordinated infrastructure planning activities that are undertaken to deliver a holistic, and integrative approach to the development of evidence-based decision-making information in support of life cycle reinvestment planning, for the development of budget submissions and a pipeline of asset reinvestment project requirements for existing realty assets.
- In addition, we manage the asset lifecycle planning needs for the IO responsibilities within the General Real Estate Portfolio (GREP) and ministry program assets for the Lifecycle Asset Management Planning (LAMP) clients.

# What is the basis for infrastructure planning at IO?

- The structure was based initially on the Province's Infrastructure Asset Management Framework, 2007/2012, and it also aligns with the planning and investment principles defined in the Infrastructure for Jobs and Prosperity Act (IJPA) 2015, and
- Alignment with ISO55001 Asset Management Information Management systems – Requirements within the context of IO's role and responsibilities

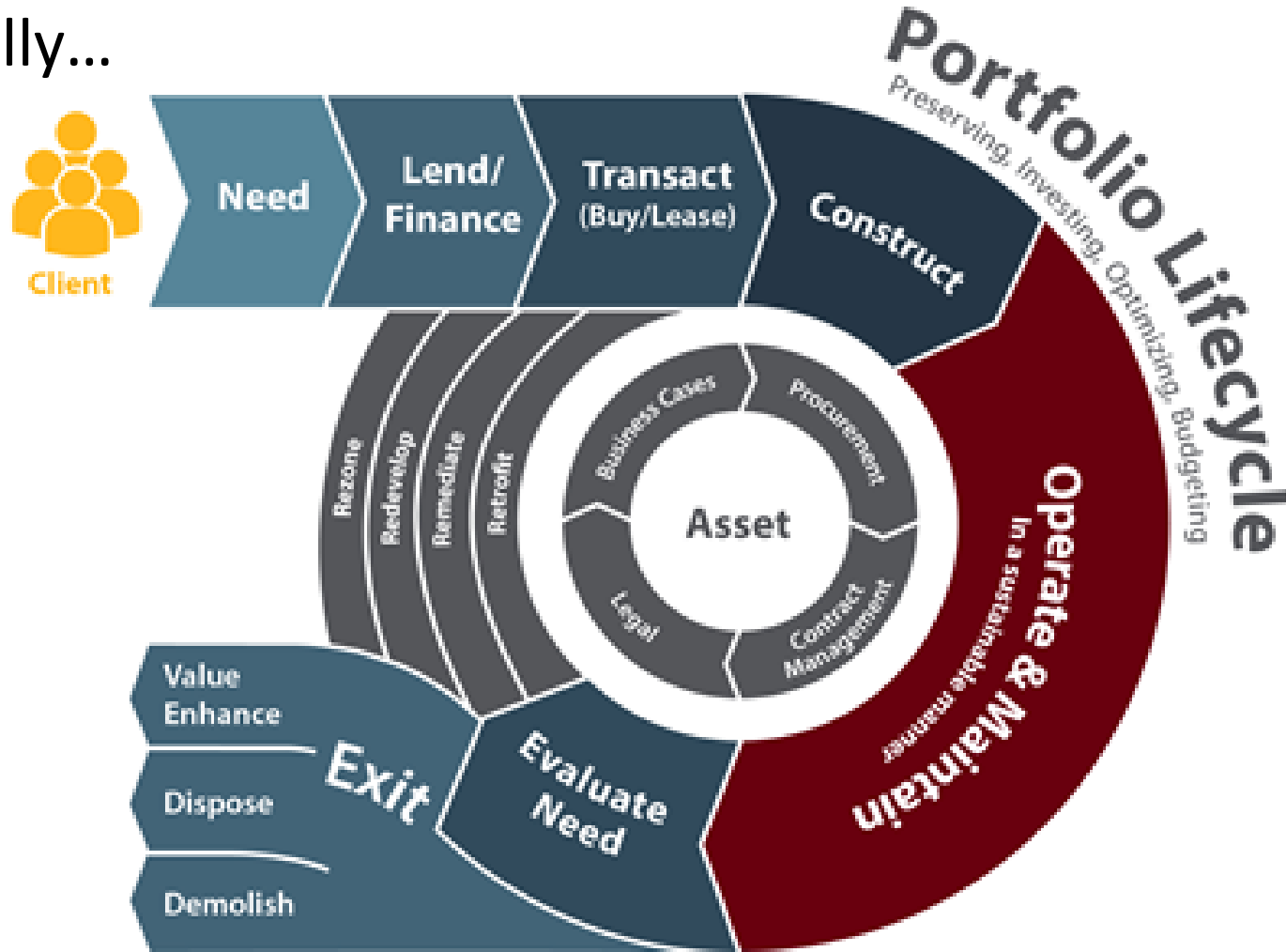
# Value Proposition

- Evidence-based asset inventory and assessment data from on-site inspections
- Standardized templates for consistent capture of reliable asset inventory and assessment data
- Long-term view to prioritized lifecycle reinvestment project requirements, indicating construction discipline and cost estimates based on industry standard unit costs
- Budget development/substantiation, leveraging ability to demonstrate impact of various funding scenarios on condition metrics
- Defendable implementation plan, supported by objective multi-dimensional prioritization
- Leveraging IO's volume purchasing power, using economies of scale, for the benefit of our clients
- Reporting available from cloud-based asset management software



# How do we do Infrastructure Planning at IO?

- Holistically...



# MOI Infrastructure Plan

- **Capital Drivers:** How projects are meeting capacity, condition, and modernization needs should be considered during discussions on prioritization or sequencing. Increasing sector standards – formal or de facto - are impacting modernization (e.g., health & safety, technology, service delivery) and the scope of future infrastructure investments (e.g., costs to new builds and future renewal).

# Factors that Contribute to Functionality



## Occupant/User Requirements

As tenant requirements change, or the underlying designated mission changes, the building's capability to provide service to its users is affected.



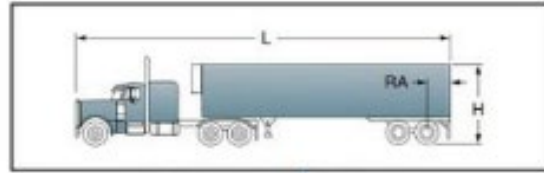
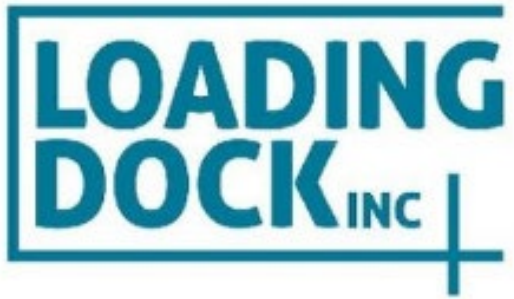
## Regulatory/Code Compliance

As new building codes, regulations, or organizational policies take effect, the building must adapt to these changes.

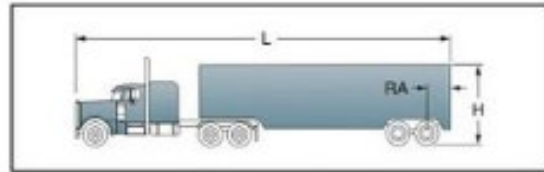


## Technical Obsolescence

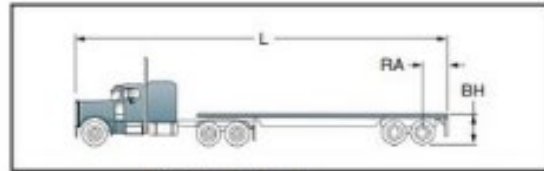
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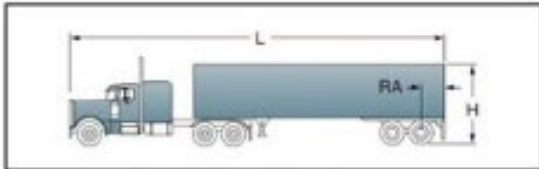
**Refrigerated Truck**



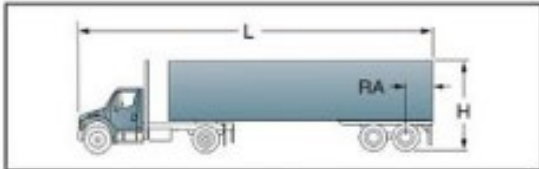
**Semitrailer, Road**



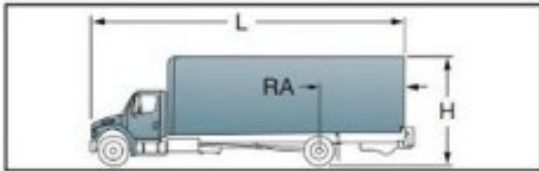
**Flatbed Truck**



**Container Truck**



**Semitrailer, City**



**Straight Truck**

| Type of Vehicle   | Truck Dimensions  |                |                   |                  |
|-------------------|-------------------|----------------|-------------------|------------------|
|                   | Overall Length, L | Bed Height, BH | Overall Height, H | Overall Width, W |
| Container         | 55' - 70'         | 56" - 62"      | 12" - 13'6"       | 96"              |
| Semitrailer, City | 30' - 35'         | 44" - 48"      | 11' - 13'         | 96"              |
| Straight Truck    | 15' - 35'         | 36" - 48"      | 11' - 12'         | 96"              |
| Refrigerated      | 40' - 55'         | 50" - 60"      | 12" - 13'6"       | 96" - 102"       |
| Semitrailer, Road | 55' - 70'         | 48" - 52"      | 12" - 13'6"       | 96" - 102"       |
| Flatbed           | 55' - 70'         | 48" - 60"      | -                 | 96" - 102"       |




# Real Estate Services

IO oversees the operation of one of Canada's largest real estate portfolios, ensuring ministries have effective facilities to deliver the programs that Ontarians rely upon.



# Deficiency by Absence

- Deficiency by Absence: What every facility should have...



## MCS

### Leasehold Asset Management Plan (LAMP)

Date: \_\_\_\_\_ B#: \_\_\_\_\_

Building Name: \_\_\_\_\_

---

**FUNCTIONAL DEFICIENCY CHECKLIST**

Does not affect building FCI

**DEFICIENCY BY ABSENCE**

**What every detention centre should have...**

| Systems | DEFICIENT  | Definition   |   |
|---------|--|--|---|
|         |  | Criteria   | Notes                                     |
| 1       | Electronic locks<br><small>CI020- Interior Doors</small> | Located at all :   |   |
|         |  | <input type="checkbox"/> All exterior exit/fire doors<br><input type="checkbox"/> Sallyport doors<br><input type="checkbox"/> Any door an inmate has access to<br><input type="checkbox"/> Control Rooms | <i>not present in wing 2 housing unit</i> |
| 2       | Electronic control module (to control cells)             | <input type="checkbox"/> Module that uses computer interface software that controls, locks, intercoms and ability to video record for 90 days  |   |
|         |  | Service Sallyport<br>One of these options must be used   |   |
|         |  | <input type="checkbox"/> Sliding gate needs to be automatically controlled by control room   |   |

| Systems | DEFICIENT  | Criteria   | Definition |
|---------|--|--|------------|
| 1       | Electronic locks<br><small>CI020- Interior Doors</small> | Located at all :   |            |
|         |  | <input type="checkbox"/> All exterior exit/fire doors<br><input type="checkbox"/> Sallyport doors<br><input type="checkbox"/> Any door an inmate has access to<br><input type="checkbox"/> Control Rooms |            |

# Deficiency by Design: What criteria for key systems that should reflect the design specs...

**MCSCS**  
Leasehold Asset Management Plan (LAMP)

Date: \_\_\_\_\_ B#: \_\_\_\_\_  
Building Name: \_\_\_\_\_

**FUNCTIONAL DEFICIENCY CHECKLIST**

**DEFICIENCY BY DESIGN**

Does not affect building FCI  
Key systems that should reflect the most current 2008 design specs...

| Systems   | DEFICIENT                | Definition                              |   |
|---|--------------------------|---|---|
|   |                          | Criteria                                | Notes                                   |
| <b>1</b><br><b>All Exterior Exit Doors with Inmate access (i.e. housing units, kitchen area, laundry, yards) &amp; Cell Doors</b><br><br><small>B2030 - Exterior Doors<br/>C1020 - Interior Doors</small> |                          | <b>**Inmate access areas only**</b>     |   |
|   |                          | <input type="checkbox"/>                | 50mm solid metal doors                  |
|   |                          | <input type="checkbox"/>                | Fasteners – Torx Plus Security (screws) |
|   |                          | <input type="checkbox"/>                | Paracentric/mogul locks                 |
|   |                          | <input type="checkbox"/>                | Electronic locks                        |
|   | <input type="checkbox"/> | Fasteners – Torx Plus Security (screws) |   |

| Systems   | DEFICIENT                | Definition                              |   |
|---|--------------------------|---|---|
|   |                          | Criteria                                | Notes                                   |
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|   |                          | <input type="checkbox"/>                | 50mm solid metal doors                  |
|   |                          | <input type="checkbox"/>                | Fasteners – Torx Plus Security (screws) |
|   |                          | <input type="checkbox"/>                | Paracentric/mogul locks                 |
|   |                          | <input type="checkbox"/>                | Electronic locks                        |
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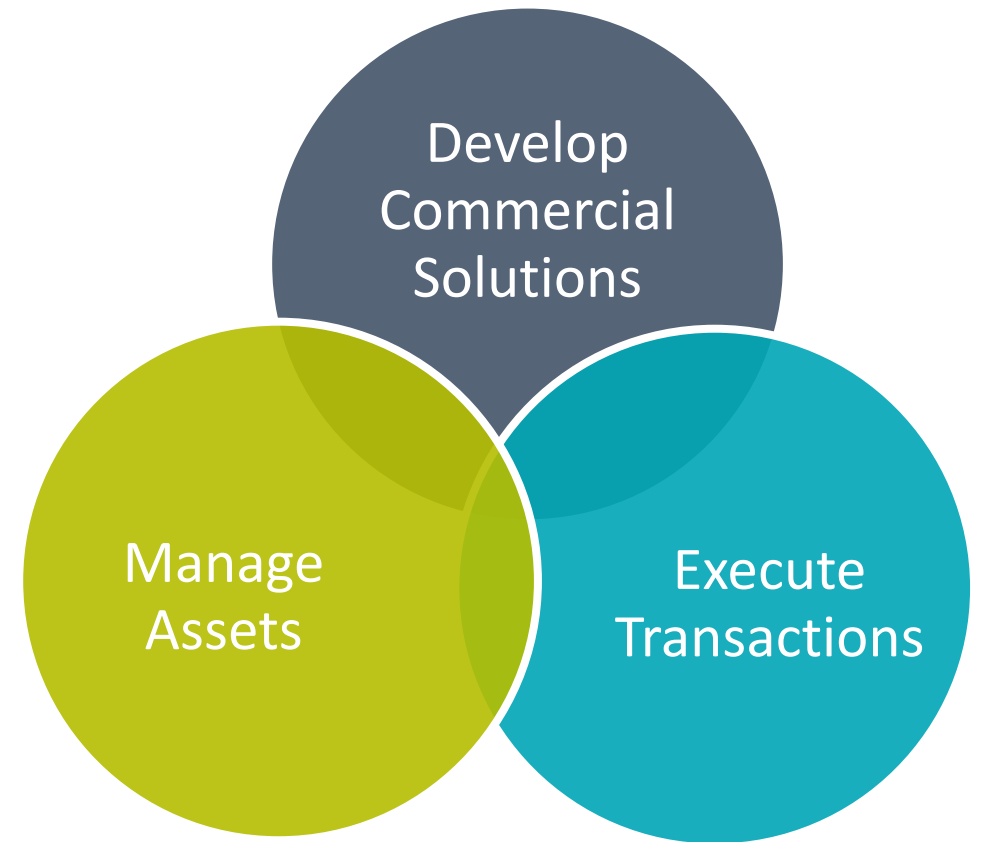


# IO's responsibilities

We develop commercial solutions

We execute transactions

We manage assets



# Classification of Need

## Condition

### Repair

Needs that may be mitigated in order to achieve/extend the systems expected useful life

### Renewal

Generated automatically for systems that are in their last 10 years of service. These systems will be assessed and replaced based on their service life.

