Appendix E

Building Condition Assessment Executive Summary and 20 Year Deferred Maintenance Summary

FINAL

Building Condition Assessment and 20 Year Capital Plan

770 Don Mills Road, North York, Ontario

Prepared for:

Infrastructure Ontario
2000 – 1 Dundas Street West
Toronto, ON M5G 1Z3

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Pinchin File: 292140.000

1.0 EXECUTIVE SUMMARY

Pinchin Ltd. (Pinchin) was retained by Infrastructure Ontario to conduct a Building Condition Assessment ("BCA") and develop a capital plan reserve fund forecast, subject to the limitations outlined in Section 7.0 of this report. The scope of work is to review the existing documents and facilities of the building, assess the need for repair and rehabilitation of building systems and components, and recommend a 20-year capital plan that incorporates capital replacement/repairs and cost estimates.

The municipal address for the property is 770 Don Mills Road, North York, Ontario, referred to as Ontario Science Centre (the Site). Pinchin personnel conducted a visual assessment of the Site from August 3rd to August 5th and August 10th to August 13th, as well as on September 16th, 2021, and interviewed and was accompanied by CBRE Facility Manager (hereafter referred to as the Site Representative).

1.1 General Facility Description

Ontario Science Centre is located on the west side of 770 Don Mills Road, North York, Ontario. For the purpose of this report, Don Mills Road is considered to be oriented in a north-south direction. The Ontario Science Centre complex was originally designed by Architect Raymond Moriyama in 1964. The complex underwent several additions such as Storage Areas, Workshops and the South Wing in 1990, Omnimax Theatre with 320 seats in 1995 and the Valley Building Restaurant in 1997.

Ontario Science Centre is a complex of three buildings (Buildings A, B and C). Building A is referred to as the Entrance Building, Building B is referred to as the Core Building and Building C is referred to as the Valley Building. These buildings are linked on different levels by a bridge and a sloped escalator shaft.

The original portion of Building A was constructed in 1969 (i.e., 52 years ago) with an addition constructed in 1995 (i.e., 26 years ago) and possesses a basement and two storeys above grade. The 1995 addition provides space for Omnimax Theatre with 320 seats and a new main entrance lobby. Building A includes a theatre, ticket counters, a two-level kitchen (the main and small kitchens), banquet halls, meeting rooms, locker areas for group visitors, a shop, offices, the main mechanical plant, electrical and sub mechanical rooms. Building A is linked by a two-level bridge over a ravine to Building B. The bridge over the ravine between Building A and Building B consists of two levels in a uniquely designed concrete structure that also provides bulkhead channels for services.

Similarly, Building B was constructed in 1969 (i.e., 52 years ago) and consists of a three-storey building and two storage basements that includes an auditorium, exhibition spaces, lecture rooms and offices. Building B is configured with three circular towers surrounding an irregular triangular space, and generally possesses three high storeys above grade except for the administration office tower which possesses four floors within the same three-storey height. The lowest level of Building B is partially below grade. Building B is linked by a sloping escalator shaft to Building C.

Building C was also constructed in 1969 (i.e., 52 years ago) with various additions; storage and security building additions constructed in 1990 (i.e., 31 years ago) and a kitchen addition constructed in 1997 (i.e., 24 years ago). Building C incorporates a high roof level for exhibition hall spaces which is consistent throughout the building. Some portions of this building include office areas on a second-floor level while there is a mezzanine level for exhibits and lecture rooms overlooking the exhibition halls within the one storey height. Building C does not possess a basement (unlike Building A and Building B which both possess basement areas providing space for the distribution of infrastructure services and for general storage). Grade levels vary around all buildings accounting for contour variations.

The exterior wall systems of Buildings A and B primarily consist of a combination of deeply ribbed, precast concrete panels with a rough hammered finish on the face of each rib, and vertical board finished cast-in-place concrete. In addition, large areas of glass set into dark brown anodized aluminum frames are located on several elevations of each building as well as on the bridge that overlooks the natural environment of the setting. The exterior wall systems of the 1995 addition of Building A includes a continuous curtain wall, with a light structural steel frame and bow-string mullions, stretched in front of the entire original east ribbed concrete panel facade set to the front edge of the overhanging concrete facia soffit of the original building. According to the Site Representative, some of the original ribbed pre-cast concrete panels of the façade of Building A were removed during the construction of this addition.

The exterior wall systems of Building C consist of vertical ribbed steel panelling where future expansion had been anticipated. The 1990 storage building addition has continued this use of similar ribbed metal cladding. The exterior wall systems of the restaurant addition of Building C consist of buff brick masonry. All exterior walls are glazed from sill height to form a high greenhouse-like space with neatly exposed services and lighting. The walls of the attached receiving and food storage facility are masonry clad on the exterior with buff bricks similar to the base of the restaurant area.

A continuous glass wall, with a light structural steel frame and bow-string mullions was inserted in front of the entire original east ribbed pre-cast concrete panel facade set to the front edge of the overhanging concrete facia soffit of the original building. Some of the original ribbed pre-cast concrete panels of the façade of Building A were removed, reclad or glazed at number of areas.

The bi-level bridge links both the upper and the lower floor levels of the Entrance Building (i.e., Building A) to the equivalent floor levels of the Core Building (i.e., Building B). This structurally significant bridge, on both levels, features a solid south wall for displays and window openings fully extending through the length and height of the north wall to direct the visitors' undivided attention to the natural environment of the Site.

The window systems, extending through the entire length of both elevations of each section of the escalator structure, visually link the visitors with the natural landscape, birds and wildlife in this 'adjustment' area on the way to the exhibition halls of the Valley Building (i.e., Building C).

The vertical transportation equipment provided for Ontario Science Centre consists of 2 hydraulic passenger elevators, 5 traction passenger elevators, 2 traction freight elevators, 1 other type stair platform lift elevator,1 hydraulic vertical platform elevator and 7 escalators (Refer to Appendix V – Elevator and Escalator Specialist Report).

Domestic Hot Water (DHW) for the complex is provided by six natural gas-fired and one electric self-contained water heaters. Three natural gas-fired DHW heaters serve Building A, one natural gas-fired DHW heater and one electric DHW heater serve Building B and 2 natural gas-fire DHW heaters serve Building C.

Heating is generated primarily by a boiler plant in the Building A powerplant mechanical room. This boiler plant consists of 2 flexible tube type, hot water heating boilers, and a natural gas-fired, forced air type, hot water heating boiler, each associated with an in-line boiler circulation pump located in the Building A main power plant mechanical room with heating pumps located in each building.

Cooling is provided by 2 centrifugal chillers located in the Building A main powerplant mechanical room while heat rejection is achieved by 2 cooling towers located on the roof of Building A. Each cooling tower has 2 cells. There are 2 primary loop chilled water circulation pumps, 3 secondary loop chilled water pumps, and 2 condenser water loop pumps each located in the Building A main power plant mechanical room.

The complex is conditioned by approximately 30 Air Handling Units (AHUs) located in various mechanical rooms throughout. These AHUs are installed with a supply fan, hot water heating coils and circulator pump, chilled water coils, steam humidification units, and a filter section. Most systems have a separate return fan. The AHUs are controlled by a Building Automation System (BAS) and possess carbon dioxide (CO2) sensors to vary ventilation rates based on demand. The complex is equipped with over 100 exhaust fans including indoor cabinet type, wall mounted propeller type, inline axial, and roof mounted mushroom type (Refer to Appendix VI – Mechanical and Electrical Specialist Report).

Electricity is supplied to the main electrical room in the basement of Building A. The main electrical service is fed by two Toronto Hydro feeders that terminate in the 27.6 kV high voltage switchgear located in the basement main electrical room. This 27.7 kV switchgear feeds 2 main transformers located in the adjacent transformer room. These transformers feed switchgear rated at 13.8 kV and consist of 11 bays complete with a tie breaker. In a second transformer room there is a "chiller" transformer. There are 12 substations fed from the 13.8 kV switchgear that serve the complex. These substations contain

switchgear panels and transformers that step down 13.8 kV to 120/208 V. Theses transformers supply distribution panels, lighting panels, or motor control centres.

The Complex is equipped with a microprocessor based distributed addressable fire alarm and detection system. The fire alarm system is equipped with emergency voice communication capability. The emergency power for the fire alarm system is provided by integral battery units and the emergency generator (Refer to Appendix VI – Mechanical and Electrical Specialist Report).

The existing fire alarm system is a 2-stage system. The main Fire Alarm Control Panel (FACP), Central Alarm Control Facility (CACF), voice amplifiers, tone generators etc. are located in the Building A main security room in Level 2. The CACF is equipped with emergency voice paging microphone, firefighter's master handset, LCD display, zone LEDs and necessary user interface. There is a 2nd CACF in the Building C security office, which is manned 24/7.

A VESDA smoke detection system protecting Building B is monitored by the fire alarm system. In addition, the kitchen hood suppression systems in Buildings A and C, and FM200 clean agent extinguishing system in Building C are monitored by the fire alarm system.

Emergency power to the complex is provided by 2 diesel powered emergency generators both located in the ground floor generator room of Building A. Each generator is attached to a Power Distribution Board and/or is connected to an Automatic Transfer Switch (ATS).

There is an Uninterrupted Power Supply (UPS) system located in the basement of Building A. This system serves a local battery cabinet and is connected to a local emergency panel. This panel serves lighting panels. In the Building B's 3rd floor mechanical electrical room there are 2 UPS systems. Each unit is connected to a battery pack and a disconnect. One UPS serves a panel that serves fire alarm equipment (Refer to Appendix VI – Mechanical and Electrical Specialist Report).

1.2 Building Systems Requiring Significant Remediation

Repair and replacement requirements (under replacement reserves) over the term of the analysis (i.e., 20 years) of $228,604,000 have been identified. As noted during the Site visits, deficiencies relating to the roof systems, wall systems, elevator systems, interior finishes, Site features, fire & life safety equipment and mechanical/electrical systems were noted. In addition, risk and probability in relation to health and safety of the occupants and failure to key components affecting the program usage and operation of the facility has been assessed and identified. For more information, please refer to Section 1.4 and Appendix III of the report.

Please note that the split in funding between OSC and IO (Charge For Accommodation – CFA) mentioned below are based on the information provided to Pinchin by the Facility Manager of the CBRE.

1.2.1 Immediate Health and Safety Needs

An amount of $16,356,366 (i.e., $1,588,100 by OSC and $14,768,266 by CFA) is required to be invested immediately (i.e., mid- fiscal year 2021 and fiscal year 2022) to address all existing health and safety hazards identified that have risen due to the deferred maintenance and age of the facility components. Please note that this amount includes $11,570,608 which may be required to reinforce the bridge link between Building A and Building B. The immediate heath and safety items are identified as follows:

- Slab on grade within Building C (warehouse portion): An investment of $601,907 to complete the required repairs and seal the cracks to remove tripping hazards;
- Suspended access equipment: An investment of $39,682 for replacement of the select adhesive roof anchors and five-year load test for worker fall protection;
- Floor finishes within the main kitchen of Building A: An investment of $647,845 for replacement of the ceramic floor tiles to remove the tripping hazards;
- Elevator systems: An investment of $37,000 for installation of top railings for worker fall protection;
- Escalator systems: An investment of $310,800 in total to install handrail UV-C antibacterial protection to prevent spreading of illnesses (recommended project);
- Exhaust ventilation systems: An investment of $20,350 for replacement of the floor polisher exhaust fan;
- Sprinkler and fire protection systems: An investment of $650,243 in total for repairs and replacement of the sprinkler and fire protection systems;
- Emergency generator fuel tanks: An investment of $101,750 for replacement of the emergency generator fuel tanks;
- Metal platforms and catwalks: An investment of $51,692 for the cooling tower roof of Building A and $137,914 for all buildings to address the safety concerns;
- Main transformer air shafts: An investment of $100,344 for concrete repairs and replacement of the grate covers to address the safety concerns;
- Side walks and exterior stairs: An investment of $2,366,091 in total to address the tripping hazards and safety concerns;
- Exterior railings and barriers: An investment of $103,020 to replace the deteriorated wooden fencing to address the safety concerns; and
- Exterior signage: An investment of $86,233 to repair the base of the signage and address the safety concerns;

An additional $45,039,246 investment (i.e., $11,738,347 by OSC and $33,300,899 by CFA) is projected to be required, to address the anticipated future health and safety hazards which will arise due to the age of the Facility's components within the remaining years (i.e., from 2023 to 2042) of the term of this analysis.

In total, an amount of $61,395,612 is projected to be required to be invested by OSC and CFA to remove the current and anticipated health and safety hazards identified within the term of the analysis (i.e., next 20 years). For more information, please refer to Appendix III.

1.2.2 Immediate Program Needs

An amount of $14,295,530 (i.e., $1,238,534 by OSC and $13,056,996 by CFA) need to be invested immediately to mitigate and remove program risk hazards (i.e., non health and safety related) affecting the program usage and operation of the facility.

Recommended repairs and replacements for the following High (H) risk and Very High (VH) risk items are listed below. Please note that the identified High (H) risk items require prioritized action, while the Very High (VH) risk items require immediate corrective action within the projected year. The identified H and VH risk items are as follows:

- The building envelope, comprised of the exterior walls, windows, exterior doors and roof systems: An investment of $1,375,214 in total is required for the immediate repairs and replacement of the older building envelope systems;
- The interior finishes: An investment of $570,700 in total is required for repairs and replacement of the overhead doors and roll up doors within the workshop areas of Building C;
- Elevator and escalator systems: An investment of $296,000 in total is required for the modernization of elevator No. 8 and installation of new door controllers;
- Sanitary and storm drainage system: An investment of $5,800,000 is required for the restoration of the drainage system to prevent back-ups and leaks within the interior spaces;
- Water services: An investment of $4,477,000 is required to for replacement of the domestic water piping. A major part of the domestic water piping system has reached the end of its service life;
- Air distribution system: An investment of $956,450 for replacement of the older Variable Frequency Drives (VFDs) serving the Air handling Units (AHUs) and Building C's Make Up Air (MUA) units; and

- Loading dock equipment: An investment of $87,801 will be required to replace the loading dock equipment to prevent interruption to the facility operations.

For a complete list of all building components please refer to Appendix III within the report.

1.2.3 Key Building Components Requiring Investments within the First Five Years (Excluding the Immediate Repairs)

Although the following key building components with high risk of failure were not included in the immediate needs, a significant investment is required to be made in these key building components within the next five years to prevent operation interruption of the facility:

- Electrical systems: It should be noted that due to the age of the electrical systems, an investment of $12,668,000 in total would be required to replace the main switch gear, electrical service and distribution equipment, branch wiring and devices within the first three years of the term of this analysis;
- Conveying systems: An amount of $4,995,000 in total is required to be invested to modernize the escalator systems of the facility within the first four years of the term of this analysis. These escalators connect Buildings B and C and are the main means of traffic between the two buildings;
- Gas distribution system: An amount of $3,052,500 would be required to be invested to replace the old gas pipes of the facility within the first five years of the term of this analysis. The natural gas piping and valves should be replaced when they reach the end of their life expectancy. Gas piping has an estimated life expectancy of approximately 50 years assuming good maintenance practices. The natural gas equipment is nearing the end of its useful life and is anticipated to fail due to age;
- Hot and chilled water distribution systems: An amount of $5,920,000 is required to be invested to restore and replace the hot and chilled water distribution system. The hot and chilled water is pumped from the main mechanical room power plant of Building A to each building via steel pipes through piping tunnels and bridge tunnels. A significant proportion of the hot and chilled water distribution valves were found to be non-operational and corrosion was reportedly found within the pipes. Replacement of the valves and piping is recommended to prevent leaks and potential service interruption.

FIVE (5) YEAR EXPENDITURE SUMMARY TABLE:

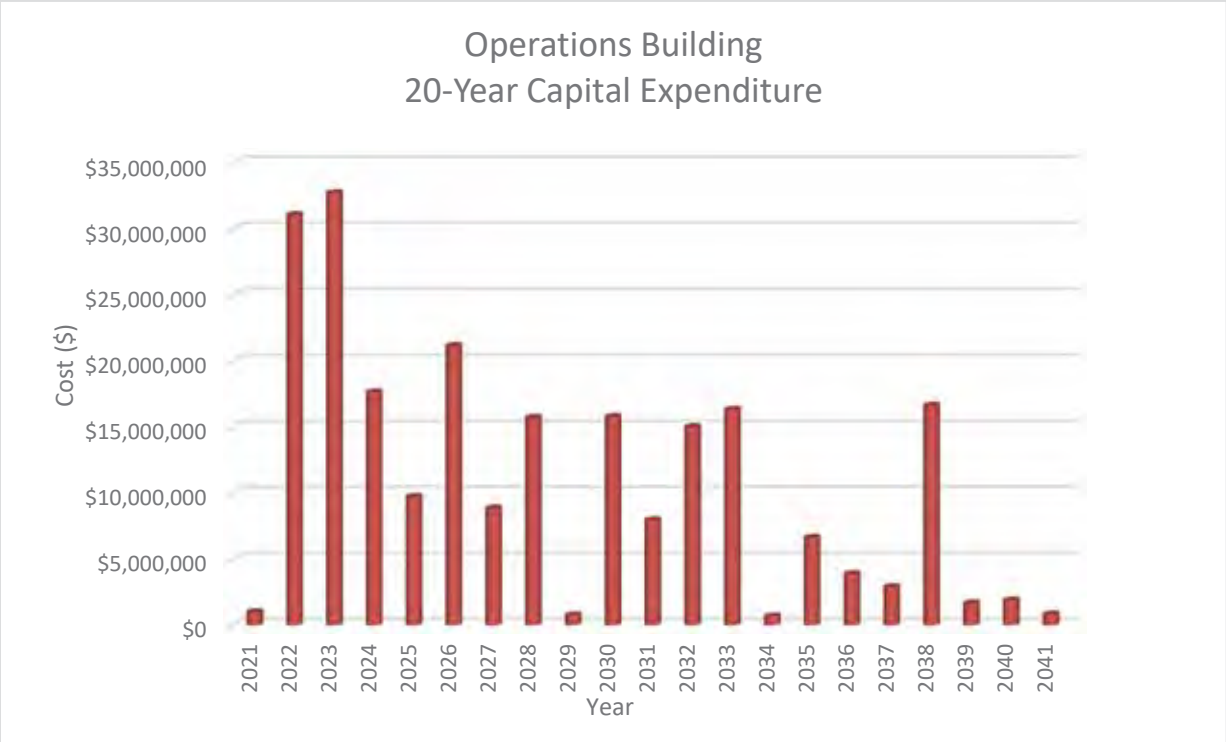
A total investment of $113,578,135 within the first five years of the term of this analysis would be required to address all required repairs and replacement of the building components. This amount includes the immediate needs, key and other building components.

Based on the Clint request, Pinchin has provided the following Expenditure table with a five-year outlook:

Building Systems and Components	2021 (Current Year)		2022		2023		2024		2025		2026		Total
	Responsibility		Responsibility		Responsibility		Responsibility		Responsibility		Responsibility		
	Infrastructure Ontario	Ontario Science Centre	Infrastructure Ontario	Ontario Science Centre	Infrastructure Ontario	Ontario Science Centre	Infrastructure Ontario	Ontario Science Centre	Infrastructure Ontario	Ontario Science Centre	Infrastructure Ontario	Ontario Science Centre	
A. SUBSTRUCTURE	$ -	$ -	$ 11,942,695	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 131,074	$ -	$ 12,073,770
B. SHELL	$ 499,891	$ -	$ 1,151,669	$ 432,106	$ 1,356,336	$ -	$ 2,889,599	$ 1,132,703	$ 3,681,489	$ 223,087	$ 13,443,833	$ 536,078	$ 25,346,791
C. INTERIORS	$ 10,583	$ -	$ 1,155,648	$ 647,845	$ 17,246	$ 433,263	$ 9,463,818	$ 715,195	$ -	$ -	$ 1,716,334	$ 1,141,012	$ 15,300,945
D10. CONVEYING	$ 37,000	$ -	$ 606,800	$ -	$ 5,281,750	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 5,925,550
D20. PLUMBING	$ -	$ -	$ 10,276,750	$ -	$ 83,250	$ -	$ 3,052,500	$ -	$ -	$ -	$ -	$ -	$ 13,412,500
D30. HVAC	$ -	$ -	$ 976,800	$ -	$ 9,573,750	$ -	$ 351,500	$ -	$ 447,700	$ -	$ 2,035,000	$ -	$ 13,384,750
D40. FIRE	$ -	$ -	$ 650,243	$ -	$ 224,390	$ -	$ -	$ -	$ -	$ -	$ 1,034,409	$ -	$ 1,909,042
D50. ELECTRICAL	$ 83,250	$ -	$ 342,250	$ -	$ 15,630,280	$ -	$ 83,250	$ -	$ 83,250	$ -	$ 1,161,800	$ -	$ 17,384,080
E.10 Equipment	$ -	$ -	$ 87,801	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
F10. SPECIAL CONSTRUCTION	$ 189,606	$ -	$ 39,682	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
G. SITE WORK	$ 203,364	$ -	$ 1,684,535	$ 1,132,256	$ -	$ 178,529	$ -	$ -	$ -	$ 5,324,935	$ -	$ -	$ 8,523,619
Total	$ 1,023,694	$ -	$ 28,914,873	$ 2,212,207	$ 32,167,002	$ 611,792	$ 15,840,667	$ 1,847,898	$ 4,212,439	$ 5,548,022	$ 19,522,451	$ 1,677,090	$113,578,135

Twenty (20) YEAR EXPENDITURE SUMMARY CHART:

The chart below provides a summary of yearly anticipated expenditures over the study period of twenty years for the facility:



1.3 Facility Condition Index and Condition Rating

A Facility Condition Index (FCI) is a measurement of the condition and renewal needs of a building, as of the date of review. Refer to the following calculation methodology:

$$\text{Facility Condition (FCI) 1} = \frac{\text{Current Need + (Planning Years 1 and 2 Need)}}{\text{Total Replacement Cost of Facility}} \times 100$$

$$\text{Facility Condition Index (FCI) 2} = \frac{\text{Deferred Maintenance}}{\text{Total Replacement Cost of Facility}} \times 100$$

As of September 29, 2021, the overall FCI 1 system average was 17%, which means that, overall, the buildings in Ontario Science Centre are in C condition (i.e., the facility and its components are functioning as intended; for most infrastructure assets, this would infer that no repairs anticipated within the next five years.). While previous various investments and budgets provided by the provincial government have

helped and supported the Ontario Science Centre to address the required costs for the building and infrastructure repairs, maintenance and renewal, major sustained investments are required to improve the condition of buildings and infrastructure.

Total Current Replacement Value:	$369,318,841
Total of Current needs:	$1,023,694
Total of Deferred Maintenance:	$63,905,874
Total of Proposed Maintenance:	$163,674,471
Facility Condition Index (FCI) 1	17%
Facility Condition Index (FCI) 2	18%

It should be noted that due to the fact that Ontario Science Centre is a facility complex with unique characteristics, an adjustment factor of 1.85 was applied to all repair and replacement costs and an adjustment factor of 1.30 was applied to all CRVs per Client's request to account for the hidden internal and external fees. It should also be noted that all costs may be subject to change due to volatile market value caused by COVID 19 pandemic.

Table 1: Facility Condition Index and Condition Rating

Calculated FCI	Description	Overall Building condition
0% - 5%	The Facility and its components are functioning as intended; limited (if any) deterioration observed on major systems.	A
6% - 10%	The Facility and its components are functioning as intended; for most infrastructure assets, this would infer that no repairs anticipated within the next five years.	B
11% - 30%	The Facility and its components are functioning as intended; normal deterioration and minor distress observed; repairs will be required within the next five years to maintain functionality.	C
31% - 60%	The Facility and its components are not functioning as intended; significant deterioration and distress observed; repairs and some minor rehabilitation required within the next year to restore functionality	D
>60%	The Facility and its components are not functioning as intended;	E

Table 1: Facility Condition Index and Condition Rating

Calculated FCI	Description	Overall Building condition
	significant deterioration and major distress observed; possible damage to support structure; may present a risk to people or materials; must be dealt with without delay.	

1.4 Overall Remaining Useful Life/ Facility Condition Summary

Average expected lifetimes of major building systems such as the building envelope (i.e., exterior walls, windows, exterior doors and roof systems), conveying systems, HVAC, fire and life safety systems are typically between 30 and 50 years, and the majority of the assets are 52 years old (circa 1969). The average theoretical facility's lifespan is estimated to be approximately 80 years. Based on Pinchin's assessment, it appears that while capital investments have been made to the building envelope systems, HVAC systems, interior finishes, plumbing systems, and electrical systems, are in large part original and have simply exceeded their expected service lives. Building systems that have reached or exceeded their useful service life, while often remaining operational, generally require higher levels of maintenance, higher annual repair costs, and carry an elevated risk of sudden failures that could limit or prevent the use of a facility for extended periods. These unexpected failures often result in higher costs for needed work that must be then performed on an emergency basis.

Based on the structural review of the bridge link between Building A and Building B completed by Jerol Technologies Inc., further review and investigation by Brent B. Roberts (Structural Engineer), repairs are required to address the safety of the bridge. Please refer to Structural Specialist Review (Appendix III) for the letter of opinion provided by the Structural Engineer dated January 31, 2022.

It is our opinion that the remaining useful life of the property can continue for its intended purpose for at least an additional 20 years if the repairs in this report are made, the physical improvements receive continuing preventative maintenance, if the various components or systems are replaced or repaired on a timely basis as needed, and Property Condition Assessments, in accordance with the most recent ASTM E2018 Standard, are conducted at least every 36 months. However, it is anticipated that a significant amount of investment in key building components is required within the first five years of the term of this analysis. Without further investment to address the immediate needs, required repairs and replacement of the key components of the facility, it is estimated that the lifespan would be significantly reduced and the probable risk of failure in many key building components is significantly increased within the next five years. The estimated remaining useful life of the facility without conducting Pinchin's recommended repairs and replacement is 5 years.

Assuming that Pinchin's recommended repairs, replacement, overhaul and retrofits for all systems are completed and regular maintenance are performed, Building A, Building B and Building C are anticipated to perform as intended and in a safe manner for occupancy. However, t he following table summarizes the Facility's condition:

Table 1.1 Ontario Science Centre (Buildings A, B, and C)

Age of the Buildings	52 years old
Average Theoretical Building Lifespan	80 years
Estimated Remaining Life with Pinchin's Recommended Repairs and Replacement	20 years
Estimated Remaining without Pinchin's Recommended Repairs and Replacement	0-5 years

1.5 Risk Identification (Risk and Probability of failure to key components)

Pinchin performed a risk evaluation for the proposed replacement / repair works for the components identified in the component inventory. The intent of the risk evaluation is to prioritize the replacement / repair works based on the likelihood and consequence of the asset / component failure.

Component failure or non-performance risk was evaluated by assessing the likelihood of the failure / non-performance and the consequences of such failure / non-performance. The risk measure for likelihood and consequence is based on 5 categories, yielding a 5 x 5 risk score as summarized in the following tables.

Likelihood	Description	Frequency of occurrence	Score
Rare	May occur in exception circumstances	> 20 years	1
Unlikely	Could possibly occur	6 - 20 years	2
Possible	Might occur	3 - 5 years	3
Likely	Will probably occur	< 2 years	4
Almost Certain	Expected to occur in most circumstances	< 1 year	5

Consequence	Injury	Service Interruption	Environment	Finance	Reputation	Score
Insignificant	Nil	< 4 hrs.	Nil	< $10k	Nil	1
Minor	First Aid	< 1 day	Minor short term	< $100k	Minor media	2
Moderate	Medical Treatment	< 1 week	Wide short term	< $500k	Moderate media	3
Major	Disability	< 1 month	Wide long term	< $1 M	High media	4
Catastrophic	Fatality	> 1 month	Irreversible	> $1 M	Censure / inquiry	5

The risk evaluation performed by Pinchin for the purposes of this work is qualitative and no risk or probabilistic modelling has been performed. Further, risk evaluations have not been performance for all component failure / non-performances, only those where the PUL of the component is less than the analysis period of 20 years (e.g., components that have a PUL of greater than the analysis period have not been assessed as they are expected to remain in service beyond the assessment period).

The assessment of component failure / non-performance only considers direct consequences. For example, the failure of a HVAC system may result in the building being closed for a period of time, which may in turn cause delays in other operations. The flow on consequences is not considered as part of this analysis as a more detailed understanding of the municipal operations is required.

Risk Score

		Consequence				
		Insignificant	Minor	Moderate	Major	Catastrophic
Likelihood	Rare	1	2	3	4	5
	Unlikely	2	4	6	8	10
	Possible	3	6	9	12	15
	Likely	4	8	12	16	20
	Almost Certain	5	10	15	20	25

Score (>=)	Level	Timing of Action Required
20	VH	Immediate corrective actions
10	H	Prioritized action required
4	M	Planned action required
1	L	Manage by routine procedures

The results of the risk assessment are included in Appendix III.

APPENDIX I

Repair and Replacement Cost Summary

Table 1 - Repair/Replacement Cost Summary
IO - Building Condition Assessment
Ontario Science Centre

UNIFORMAT II
LEVEL 1
LEVEL 2
LEVEL 3

UniFormat Code	Item Name	Location and/or Area Serviced	Normal Life Expectancy	Actual or Estimated Year of Acquisition	Present Age	Adjustment To Life Expectancy	Replacement Responsibility	Level of Operation Interruption	2021 Current Year	2022 1 yr. Cost	2023 2 yr. Cost	2024 3 yr. Cost	2025 4 yr. Cost	2026 5 yr. Cost	2027 6 yr. Cost	2028 7 yr. Cost	2029 8 yr. Cost	2030 9 yr. Cost	2031 10 yr. Cost	2032 11 yr. Cost	2033 12 yr. Cost	2034 13 yr. Cost	2035 14 yr. Cost	2036 15 yr. Cost	2037 16 yr. Cost	2038 17 yr. Cost	2039 18 yr. Cost	2040 19 yr. Cost	2041 20 yr. Cost	**1-20 Year Total***
A	SUBSTRUCTURE																													
A10	Foundations																													
A1010	Standard Foundations-Original Portion																													
A1030	Slab on Grade																													
A1030	Slab on Grade	Building C-Warehouse Portion	100	1969	52	0	IO	Medium		$601,907																				**$601,907**
A20	Basement Construction																													
A2010	Basement Excavation																													
A2020	Basement Walls																													
A2010	Basement Walls	Building A	100	1969	52	0	IO	Medium						$131,074																**$131,074**
B	SHELL																													
B10	Super Structure																													
B1010	Floor Construction																													
B1010	Floor Construction	Bridge	100	1969	52	0	IO	High		$11,101,496					$156,371					$156,371					$156,371					**$11,570,608**
B1010	Floor Construction	Building A- Power Plant	100	1969	52	0	IO	Low		$44,391																				**$44,391**
B1010	Floor Construction	Mechanical Room/Janitorial Room- Escalator Shaft	100	1969	52	0	IO	Low							$34,493															**$34,493**
B1020	Roof Construction																													
B1020	Roof Construction	Building A- Monitor and Replace Siporex	100	1969	52	0	IO	Medium		$51,740					$51,740					$51,740					$51,740					**$206,960**
B1020	Roof Construction	Building B- Monitor and Replace Siporex	100	1969	52	0	IO	Medium		$51,740					$51,740					$51,740					$51,740					**$206,960**
B1020	Roof Construction	Building C	100	1969	52	0	IO	Medium		$51,740					$51,740					$51,740					$51,740					**$206,960**
B1029	Roof Construction	Other Roof Systems- Roof Anchors	100	1969	52	0	IO	Medium		$39,682					$39,682					$39,682					$39,682					**$158,728**
B20	Exterior Enclosure																													
B2010	Exterior Walls																													
B2011	Exterior Wall Construction-Exterior Concrete Walls	Building A- Concrete Walls	100	1969	52	0	IO	Low					$172,466					$172,466					$172,466					$172,466		**$689,864**
B2011	Exterior Wall Construction-Exterior Concrete Walls	Building B- Concrete Walls	100	1969	52	0	IO	Low					$241,453					$241,453					$241,453					$241,453		**$965,812**
B2011	Exterior Wall Construction-Exterior Concrete Walls	Building C- Concrete Walls	100	1969	52	0	IO	Low	$45,468				$341,413					$341,413					$341,413					$341,413		**$1,365,654**
B2011	Exterior Wall Construction-Exterior Concrete Walls	Bridge Link- Concrete Walls	100	1969	52	0	IO	Low					$394,262																	**$394,262**
B2011	Exterior Wall Construction-Exterior Concrete Walls	Escalator Link- Concrete Walls	100	1969	52	0	IO	Low					$103,480					$103,480					$103,480					$103,480		**$413,920**
B2011	Exterior Wall Construction - Precast Concrete Panel Cladding	Building A- Precast Concrete Panels	75	1969	52	0	IO	Low					$200,060										$200,060							**$400,120**
B2011	Exterior Wall Construction - Precast Concrete Panel Cladding	Building B- Precast Concrete Panels	75	1969	52	0	IO	Low					$206,960										$206,960							**$413,920**
B2011	Exterior Wall Construction - Precast Concrete Panel Cladding	Building C- Precast Concrete Panels	75	1969	52	0	IO	Low					$354,544										$354,544							**$709,088**
B2011	Exterior Wall Construction - Metal Siding	Building A - Metal Cladding	35	1998	25	20	OSC	Low				$61,217					$61,217					$61,217				$61,217			**$244,868**
B2011	Exterior Wall Construction - Metal Siding	Building C - Metal Cladding	Varies	Varies	Varies	20	IO	Low				$295,467					$295,467					$295,467				$295,467			**$1,181,868**
B2011	Exterior Wall Construction-Exterior Walls Cleaning	Building A- Exterior Walls Cleaning - All alexations	Varies	1969	52	0	IO	Low				$263,717																		**$263,717**
B2011	Exterior Wall Construction-Exterior Walls Cleaning	Building C- Exterior Walls Cleaning - Northeast Corner	Varies	1969	52	0	IO	Low			$63,016																			**$63,016**
B2011	Exterior Wall Construction-Exterior Sealants	All Buildings	5	2020	1	0	IO	Low					$240,999					$240,999					$240,999					$240,999		**$963,996**
B2012	Parapets	Building A- Roof Parapets	100	1969	52	0	IO	Low		$48,604																				**$48,604**
B2012	Parapets- Below Threshold	Building B- Roof Parapets	100	1969	52	0	IO	Low																						
B2012	Parapets- Below Threshold	Building C- Roof Parapets	100	1969	52	0	IO	Low																						
B2012	Parapets- Below Threshold	Bridge Link- Roof Parapet- No Capital Cost	100	1969	52	0	IO	Low																						
B2012	Parapets- Below Threshold	Escalator Shaft- Roof Parapet- No Capital Cost	100	1969	52	0	IO	Low																						
B2013	Exterior Louvers, Screens, and Fencing - Metal Louvers	Building A- North and South Elevation	50	1969	52	-12	IO	Low											$469,911											**$469,911**
B2020	Exterior Windows																													
B2021	Windows - Fixed IG Units in Punched Opening	Building A- Window systems	40	1969	52	1	IO	Medium				$452,150																		**$452,150**
B2021	Windows - Fixed IG Units in Punched Opening	Building B- Window systems	40	1969	52	1	IO	Medium				$1,764,424																		**$1,764,424**
B2021	Windows - Fixed IG Units in Punched Opening	Building C- Window systems	40	1990	31	1	IO	Medium										$870,015												**$870,015**
B2021	Windows - Fixed IG Units in Punched Opening	Building C- Roof Window/Greenhouse	50	1992	29	1	IO	Medium							$269,915															**$269,915**
B2023	Windows - Fixed IG Units in Punched Opening	Escalator Link- 1969 Storefronts	45	1969	52	0	IO	Medium						$368,388																**$368,388**
B2022	Curtain Walls	Building A- East Elevation Curtain Wall	50	1998	25	0	OSC	Medium		$346,186			$223,087					$223,087					$223,087					$223,087		**$1,238,534**
B2022	Curtain Walls	Building B- South Elevation Curtain Wall	50	2007	14	0	IO	Medium												$75,440										**$75,440**
B2022	Curtain Wall	Building C- Northeast Elevation Curtain Wall	50	2005	16	0	IO	Medium										$74,227												**$74,227**
B2022	Curtain Walls	Building C- Kitchen Addition Curtain Wall	50	1997	24	0	IO	Medium					$167,733																	**$167,733**

* An adjustment factor of 1.65 was applied to all costs per Client's request.

Uniformat Code	Item Name	Location and/or Area Serviced	Normal Life Expectancy	Actual or Estimated Year of Acquisition	Present Age	Adjustment To Life Expectancy	Replacement Responsibility	Level of Operation Interruption	2021 Current Year	2022 1 yr. Cost	2023 2 yr. Cost	2024 3 yr. Cost	2025 4 yr. Cost	2026 5 yr. Cost	2027 6 yr. Cost	2028 7 yr. Cost	2029 8 yr. Cost	2030 9 yr. Cost	2031 10 yr. Cost	2032 11 yr. Cost	2033 12 yr. Cost	2034 13 yr. Cost	2035 14 yr. Cost	2036 15 yr. Cost	2037 16 yr. Cost	2038 17 yr. Cost	2039 18 yr. Cost	2040 19 yr. Cost	2041 20 yr. Cost	1-20 Year Total*
B2022	Curtain Walls	Building C- Security Building Addition Curtain Wall	50	1997	24	0	IO	Medium					$69,889																	$69,889
B2022	Curtain Walls	Building C- Greenhouses	50	1997	24	0	IO	Medium			$87,600																			$87,600
B2023	Storefronts	Building A- West Elevation 1969 Storefronts	45	1969	52	0	IO	Medium	$58,501					$1,594,868																$1,594,868
B2023	Storefronts	Building B- All Elevation 1969 Storefronts	45	1969	52	0	IO	Medium						$2,455,066																$2,455,066
B2023	Storefronts	Building C- North elevation 1969 Storefronts	45	1969	52	0	IO	Medium						$1,443,544																$1,443,544
B2023	Storefronts	Bridge Link- 1969 Storefronts	45	1969	52	0	IO	Medium						$1,804,687																$1,804,687
B2030	Exterior Doors																													
B2031	Glazed Doors & Entrances	Building A- All Elevation	30	Varies	Varies		0	OSC	Medium																					$0
B2031	Glazed Doors & Entrances	Building B- All Elevation	30	Varies	Varies		0	IO	Medium																					$0
B2031	Glazed Doors & Entrances	Building C- All Elevation	30	Varies	Varies		0	IO	Medium																					$0
B2032	Solid Exterior Doors - Single metal doors	Building A- All Elevation	30		1998	25	1	OSC	Low		$30,730																			$30,730
B2032	Solid Exterior Doors - Single metal doors	Building B- All Elevation	30		2000	21	1	IO	Low									$153,652												$153,652
B2032	Solid Exterior Doors - Single metal doors	Building C- All Elevation	30	Varies	Varies		1	IO	Low		$61,461				$61,461					$61,461					$61,461					$245,844
B2034	Overhead Doors	Building A- South Elevation	40		1969	52	1	IO	Low		$43,179																			$43,179
B2034	Overhead Doors	Building C- East Elevation	40		1969	52	1	IO	Low		$87,801																			$87,801
B2034	Overhead Doors	Building C- East Elevation	40		1990	31	1	IO	Low									$87,801												$87,801
B30	Roofing																													
B3010	Roof Coverings																													
B3011	Roof Finishes	Building A- The main roof and the northern mechanical penthouse	20		2012	9	0	IO	Low						$5,777,281															$5,777,281
B3011	Roof Finishes	Building A- The cooling tower roof	25		2000	21	-4	IO	Low		$839,547																			$839,547
B3011	Roof Finishes	Building A- The Omnimax Theater roof (not including the dome)	25		1998	25	3	OSC	Low						$536,078															$536,078
B3011	Roof Finishes	Building A- The single ply roofing system	25		1998	25	3	OSC	Low				$1,071,486																	$1,071,486
B3011	Roof Finishes	Building A- The metal roofing system	40		1998	25	0	OSC	Low		$55,189									$55,189										$110,378
B3011	Roof Finishes	Building B - The IRMA System Area of Building B	25		2007	14	0	IO	Low											$5,459,780										$5,459,780
B3011	Roof Finishes	Building B - The Green Roofing System - South and West Towers	30		2008	13	0	IO	Low																	$1,728,265				$1,728,265
B3011	Roof Finishes	Building C - Section C5	25	~ 1995	25+	1	0	IO	Low	$395,922																				$395,922
B3011	Roof Finishes	Building C - Sections C13, C14, C15-B, and C15-C	25	~ 1995	25+	1	0	IO	Low			$490,063																		$490,063
B3011	Roof Finishes	Building C - Sections C1, C2, C6-B,C10,C14-B, C14-C, C17 and C20	25	~2002	~21		0	IO	Low						$3,556,408														$3,556,408
B3011	Roof Finishes	Building C - Sections C8, C9, C11, and C16-A	25	~2006	~15		1	IO	Low										$2,527,012											$2,527,012
B3011	Roof Finishes	Building C - Sections C3, and C4	15		2020	1	1	IO	Low														$4,239,803							$4,239,803
B3011	Roof Finishes	Building C - The metal roofing systems	40		1998	25	0	IO	Low				$113,842										$113,842							$227,684
B3011	Roof Finishes	Bridge Link - Modified Bitumen Roofing System	25	~2000		21	0	IO	Low			$715,657																		$715,657
B3011	Roof Finishes	Excalator Link -Single Ply Roofing System	17		2007	14	0	IO	Low					$1,188,230																$1,188,230
B3011	Roof Finishes	Excalator Link - Green Roofing System	30		2008	13	0	OSC	Low																	$130,684				$130,684
B3020	Roof Openings																													
B3021	Glazed Roof Openings	Building A- Main Roof Skylight	20		2007	14	0	IO	Low						$910,622															$910,622
B3021	Glazed Roof Openings	Building B- Main Roof Skylight	20		2007	14	0	IO	Low						$980,057															$980,057
B3021	Glazed Roof Openings	Building C-Roof Skylights	20		2007	14	0	IO	Low						$304,920															$304,920
B3021	Glazed Roof Openings	Excalator Link- Circular Dome Skylights	20		1969	52	0	IO	Low		$71,077																			$71,077
C	INTERIORS																													
C10	Interior Construction																													
C1010	Partitions																													
C1011	Fixed Partitions -Below Threshold	Building A- Partition Walls	100		1969	52	0	IO	Medium																					
C1011	Fixed Partitions -Below Threshold	Building B- Partition Walls	100		1969	52	0	IO	Medium																					
C1011	Fixed Partitions -Below Threshold	Building C- Partition Walls	100		1969	52	0	IO	Medium																					
C1020	Interior Doors																													
C1021	Interior Doors -Blow Threshold	Building A- Interior Doors	Varies		Varies	Varies	0	IO	Medium																					
C1021	Interior Doors -Blow Threshold	Building B- Interior Doors	Varies		Varies	Varies	0	IO	Medium																					
C1021	Interior Doors -Blow Threshold	Building C- Interior Doors	Varies		Varies	Varies	0	IO	Medium																					
C1021	Overhead Doors- Roll-up	Building C-Interior Doors	30		1969	52	1	IO	Medium		$489,177																			$489,177
C1021	Overhead Doors- Vertical Lift	Building C-Interior Doors	30		1969	52	1	IO	Medium		$81,530																			$81,530
C1030	Fittings																													
C1031	Fabricated Toilet Partitions	Building A- Toilet Partition	15		2016	5	0	IO	Medium										$182,814											$182,814
C1031	Fabricated Toilet Partitions	Building B- Toilet Partition	15		2018	3	0	IO	Medium										$131,074											$131,074
C1031	Fabricated Toilet Partitions	Building C - Toilet Partition-Exhibition Areas	15		2018	3	0	IO	Medium										$106,929											$106,929
C1031	Fabricated Toilet Partitions	Building C - Toilet Partition-Security Addition	15		1990	31	2	IO	Medium			$17,246																		$17,246
C1031	Fabricated Toilet Partitions	Building C - Toilet Partition-Workshop and Storage Areas	15		1990	31	2	OSC	Medium			$27,595																		$27,595
C20	Stairs																													
C2010	Stair Construction																													
C2011	Regular Stairs	Building A- Stairs	75		1969	52	0	IO	Medium				$213,574																	$213,574
C2011	Regular Stairs	Building B- Stairs	75		1969	52	0	IO	Medium				$497,973																	$497,973
C2011	Regular Stairs	Building C- Stairs	75		1969	52	0	IO	Medium				$411,453																	$411,453
C30	Interior Finishes																													
C3010	Wall Finishes																													
C3011	Wall Finishes to Interiors - Painted Gypsum Board and Plaster Walls	Building A- Interior Walls	10		2017	4	0	Shared Responsibilit	Medium						$292,251										$292,251				$584,502
C3011	Wall Finishes to Interiors - Painted Gypsum Board and Plaster Walls	Building B- Interior Walls	10		2017	4	0	Shared Responsibilit	Medium						$702,093										$702,093				$1,404,186
C3011	Wall Finishes to Interiors - Painted Gypsum Board and Plaster Walls	Building C- Interior Walls	10		2017	4	0	Shared Responsibilit	Medium						$916,797										$916,797				$1,833,593
C3011	Wall Finishes to Interiors - Painted Concrete Masonry Walls- Workshop Area	Building C- Interior Walls	10		2010	11	3	IO	Medium				$261,396									$261,396							$522,792
C3011	Wall Finishes to Interiors - Ceramic Wall Tiles	Building A- Kitchen Walls	20		1998	25	3	OSC	Medium				$100,344																$100,344
C3011	Wall Finishes to Interiors - Ceramic Wall Tiles	Building A- Washroom Walls	20		2005	16	0	IO	Medium									$81,529											$81,529
C3011	Wall Finishes to Interiors - Ceramic Wall Tiles	Building B- Washroom Walls	20		2008	15	0	IO	Medium									$835,084											$835,084
C3011	Wall Finishes to Interiors - Ceramic Wall Tiles - Public Areas	Building C- Washroom Walls	20		2008	15	0	IO	Medium									$812,786											$812,786
C3011	Wall Finishes to Interiors - Ceramic Wall Tiles - Storage and Security Additions	Building C- Washroom Walls	20		2008	15	0	OSC	Medium			$140,010																	$140,010
C3011	Wall Finishes to Interiors - Precast Concrete Panels and Boarded Finished Concrete Walls- Below Threshold	Building A						IO	Medium																					
C3011	Wall Finishes to Interiors - Precast Concrete Panels and Boarded Finished Concrete Walls- Below Threshold	Building B						IO	Medium																					
C3011	Wall Finishes to Interiors - Precast Concrete Panels and Boarded Finished Concrete Walls	Building C						IO	Medium	$10,583																				$10,583
C3020	Floor Finishes																													
C3021	Floor Finishes -Ceramic Tiles	Building A- Ceramic Tiles in the Kitchens	30		1969	52	3	OSC	Medium		$647,845																			$647,845

* An adjustment factor of 1.65 was applied to all costs per Client's request.

Uniformat Code	Item Name	Location and/or Area Serviced	Normal Life Expectancy	Actual or Estimated Year of Acquisition	Present Age	Adjustment To Life Expectancy	Replacement Responsibility	Level of Operation Interruption	2021 Current Year	2022 1 yr. Cost	2023 2 yr. Cost	2024 3 yr. Cost	2025 4 yr. Cost	2026 5 yr. Cost	2027 6 yr. Cost	2028 7 yr. Cost	2029 8 yr. Cost	2030 9 yr. Cost	2031 10 yr. Cost	2032 11 yr. Cost	2033 12 yr. Cost	2034 13 yr. Cost	2035 14 yr. Cost	2036 15 yr. Cost	2037 16 yr. Cost	2038 17 yr. Cost	2039 18 yr. Cost	2040 19 yr. Cost	2041 20 yr. Cost	1-20 Year Total*
C3021	Floor Finishes -Ceramic Tiles	Building C - Ceramic Tiles within the Public Washroom	30	2008	15	0	IO	Medium															$81,210							**$81,210**
C3021	Floor Finishes -Ceramic Tiles	Building C - Ceramic Tiles Within the staff Washroom of Security and Storage Building Additions	30	1990	31	2	OSC	Medium			$101,598																			**$101,598**
C3021	Floor Finishes -Carpet Tiles	Building A- Carpet Tiles Within Mezzanine Level Offices	15	2013	8	0	OSC	Medium								$369,015														**$369,015**
C3021	Floor Finishes -Carpet Tiles	Building B- Carpet Tiles Within Offices and Auditoriums	15	2013	8	0	OSC	Medium								$1,706,775														**$1,706,775**
C3021	Floor Finishes -Carpet Tiles	Building C- Carpet Tiles Within Offices and Exhibition Areas	15	2013	8	0	OSC	Medium								$1,095,474														**$1,095,474**
C3021	Floor Finishes -Carpet Tiles	Building A- Sheet Carpet Tiles Within the Main Entrance	15	2013	8	0	OSC	Medium													$196,297									**$196,297**
C3021	Floor Finishes -Carpet Tiles	Building C- Sheet/ Tile Carpet Tiles Within the Main Level Kitchen of the Security Building Addition	15	1990	31	0	OSC	Medium				$41,386																		**$41,386**
C3021	Interior Finishes- Vinyl Floor Tiles	Building A- Vinyl floor tiles in the kitchen/ banquet hall corridors	20	1998	25	3	OSC	Medium				$236,686																		**$236,686**
C3021	Interior Finishes	Building C- Vinyl floor tiles in the exhibition hall and offices	20	1990	31	5	IO	Medium						$1,716,334																**$1,716,334**
C3021	Interior Finishes- Luxury Type Vinyl Floor Tiles - Below Threshold	Building A- Luxury vinyl tiles within the main entrance					OSC	Medium																						
C3021	Interior Finishes- Luxury Type Vinyl Floor Tiles - Below Threshold	Building B- Luxury vinyl tiles on the mezzanine					IO	Medium																						
C3021	Interior Finishes- Vinyl Floor Sheet	Building C- Vinyl sheet on the mezzanine and storage building flooring					IO	Medium								$1,654,998														**$1,654,998**
C3021	Interior Finishes- Terrazzo Flooring- Below Threshold	Building A- Terrazzo Flooring					IO	Medium																						
C3021	Interior Finishes- Terrazzo Flooring - Below Threshold	Building B- Terrazzo Flooring					IO	Medium																						
C3021	Interior Finishes- Terrazzo Flooring - Below Threshold	Building C- Terrazzo Flooring					IO	Medium																						
C3021	Interior Finishes- Laminated Floor Tiles - Below Threshold	Building A- Laminated flooring in the banquet halls					OSC	Medium																						
C3023	Hardeners and Sealers- Waterproofing	Building A- Power Plant	25	2022	0	0	IO	Medium		$529,628																				**$529,628**
C3023	Hardeners and Sealers- Waterproofing	Building B- South Tower Mechanical Penthouse	25	2022	0	0	IO	Medium		$28,221																				**$28,221**
C3030	Ceiling Finishes																													
C3031	Ceiling Finishes- Suspended Ceiling Assemblies	Building A- Throughout the Building	25	1998	25	3	OSC	Medium				$336,779																		**$336,779**
C3031	Ceiling Finishes- Suspended Ceiling Assemblies	Building C- Storage and Security Building additions Offices and Education rooms on the Mezzanine level	25	1998	25	3	OSC	Medium						$1,141,012																**$1,141,012**
C3031	Ceiling Finishes- Suspended Ceiling Assemblies	Building C - Weston Exhibition Hall- No Capital Cost	25	2017	4	0	IO	Medium																						**$0**
C3031	Ceiling Finishes- Painted Gypsum Ceilings- Maintain through operating budget	Building A- Throughout the Building	30	1998	25	25	IO	Medium																						
C3031	Ceiling Finishes- Painted Gypsum Ceilings- Maintain through operating budget	Building B- Throughout the Building	30	1998	25	25	IO	Medium																						
C3031	Ceiling Finishes- Painted Gypsum Ceilings-Maintain through operating budget	Building C- Throughout the Building	30	1990	31	20	IO	Medium																						
C3031	Ceiling Finishes- AMC Ceiling Finishes- Optional	Building A- Throughout the Building	40	1969	52	2	IO	Medium				$2,922,519																		**$2,922,519**
C3031	Ceiling Finishes- AMC Ceiling Finishes- Optional	Building B- Throughout the Building	40	1969	52	2	IO	Medium				$1,694,785																		**$1,694,785**
C3031	Ceiling Finishes- AMC Ceiling Finishes- Optional	Building C - Throughout the Building	40	1969	52	2	IO	Medium				$3,462,118																		**$3,462,118**
C3040	Fittings																													
C3041	Kitchen Millwork	Building A- Kitchen Millwork Within the Powerplant	25	1969	52	1	IO	Medium		$27,092																				**$27,092**
C3041	Kitchen Millwork- Below Threshold	Building A- Kitchen Millwork within the mezzanine level office	25	2008	13	0	OSC	Medium																						
C3041	Kitchen Millwork	Building B- Kitchen Millwork within the offices	25	2008	13	0	OSC	Medium													$60,206									**$60,206**
C3041	Kitchen Millwork	Building C- Kitchen Millwork within the offices	25	1990	31	2	OSC	Medium			$100,845																			**$100,845**
C3041	Washroom Millwork	Building A- Washroom Millwork	25	2008	13	0	IO	Medium										$171,588												**$171,588**
C3041	Washroom Millwork	Building B- Washroom Millwork	25	2008	13	0	IO	Medium										$37,629												**$37,629**
C3041	Washroom Millwork	Building C - Washroom Millwork- Public Washrooms	25	2008	13	0	IO	Medium										$108,371												**$108,371**
C3041	Washroom Millwork	Building C- Staff Washroom Millwork	25	1990	31	2	OSC	Medium			$63,216																			**$63,216**
D	SERVICES																													
D10	Conveying																													
D1010	Elevators & Lifts																													
D1011	Apotex Elevator - Door Operator	Building A - Apotex Lobby Passenger	20	1997	24	1	IO	Low		$27,750																				**$27,750**
D1011	Apotex Elevator - Major modernization	Building A - Apotex Lobby Passenger	25	1997	24	2	IO	Medium			$286,750																			**$286,750**
D1011	Elevator No. 6 - Door Operator	Building C - East Technology	20	2008	13	7	IO	Low								$27,750														**$27,750**
D1011	Elevator No 6 - Major modernization	Building C - East Technology	25	2008	13	9	IO	High										$508,750												**$508,750**
D1011	Elevator # 6 - Rooftop Railings	Building C - East Technology	30	N/A	N/A	N/A	IO	Medium	$18,500																					**$18,500**
D1011	Elevator No 1 and 2 - Door Operator	Building B- Main Elevators	20	2008	13	7	IO	Low								$55,500														**$55,500**
D1011	Elevator No 1 and 2 - Major modernization	Building B-Main Elevators	25	2008	13	9	IO	Medium										$1,017,500												**$1,017,500**
D1011	Elevator No 8 - Major modernization	Building C - South Building Security	30	1991	30	1	IO	Medium		$268,250																				**$268,250**
D1011	Elevator No 7 - Door Operator	Building C - West Rain Forest	20	2008	13	7	IO	Low								$27,750														**$27,750**
D1011	Elevator No 7 - Major modernization	Building C - West Rain Forest	25	2008	13	9	IO	Medium										$508,750												**$508,750**
D1011	Elevator No 7 - Rooftop Railings	Building C - West Rain Forest	30	N/A	N/A	N/A	IO	Low	$18,500																					**$18,500**
D1011	Elevator No 4 - Door Operator	Building B -West Tower	20	2015	6	14	IO	Low																$27,750						**$27,750**
D1011	Elevator No 4 – Major modernization	Building B- West Tower	25	2015	6	19	IO	Medium																				$508,750		**$508,750**
D1012	Freight Elevators																													
D1012	Small Freight No 5 - Major modernization	Building A- Kitchen	25	2008	13	10	IO	High											$809,375											**$809,375**
D1012	Freight Elevator No 3 - Major modernization	Building A -Main Lobby	25	2008	13	10	IO	High											$1,156,250											**$1,156,250**
D1012	Freight Elevators																													
D1013	Stair Lift - Major modernization	Building C	30	2012	9	20	IO	Low																					$64,750	**$64,750**
D1013	Vertical Platform - Major modernization	Building C	30	2005	16	14	IO	Medium																$74,000						**$74,000**
D1020	Escalators & Moving Walks																													
D1021	Main Escalators No 1-6 - Major modernization	Escalator Shaft	35	1968	53	2	IO	High			$4,995,000																			**$4,995,000**
D1021	Main Escalators No 1-6 - Hendrail UV-C Antibacterial Protection	Escalator Shaft	30	N/A	N/A	N/A	IO	Low		$266,400																				**$266,400**
D1021	Apotx Lobby Escalator - Major Refurbishment	Building A - Apotex Lobby	35	1997	24	11	IO	High												$155,400										**$155,400**
D1021	Apotx Lobby Escalator - Hendrail UV-C Antibacterial Protection	Building A - Apotex Lobby	30	N/A	N/A	N/A	IO	Low		$44,400																				**$44,400**
D20	Plumbing																													
D2010	Plumbing Fixtures																													
D2010	Plumbing Fixtures	All Buildings	25	2005	16	0	IO											$2,116,400												**$2,116,400**
D2020	Water Service																													
D2020	Water Service	All Buildings	40	1968	53	14	IO			$4,477,000																				**$4,477,000**
D2022	Hot Water Service- Domestic Hot Water Heaters	Building A	15	2015	6	0	IO											$120,250												**$120,250**
D2022	Hot Water Service- Domestic Hot Water Heaters	Building B	15	2020	1	0	IO																	$40,700						**$40,700**

* An adjustment factor of 1.65 was applied to all costs per Client's request.

Uniformat Code	Item Name	Location and/or Area Serviced	Normal Life Expectancy	Actual or Estimated Year of Acquisition	Present Age	Adjustment To Life Expectancy	Replacement Responsibility	Level of Operation Interruption	2021 Current Year	2022 1 yr. Cost	2023 2 yr. Cost	2024 3 yr. Cost	2025 4 yr. Cost	2026 5 yr. Cost	2027 6 yr. Cost	2028 7 yr. Cost	2029 8 yr. Cost	2030 9 yr. Cost	2031 10 yr. Cost	2032 11 yr. Cost	2033 12 yr. Cost	2034 13 yr. Cost	2035 14 yr. Cost	2036 15 yr. Cost	2037 16 yr. Cost	2038 17 yr. Cost	2039 18 yr. Cost	2040 19 yr. Cost	2041 20 yr. Cost	1-20 Year Total*
D2022	Hot Water Service- Domestic Hot Water Heaters	Building C	15	2008	13	0	O				$83,250															$83,250				$166,500
D2030	Sanitary Waste																													
D2030	Sanitary Waste	All Buildings	40	1,969	52	13	O			$4,782,250																				$4,782,250
D2040	Rain Water Drainage																													
D2040	Rain Water Drainage	All Buildings	50	1969	52	3	O			$1,017,500																				$1,017,500
D2090	Other Plumbing Systems																													
D2091	Gas Distribution	All Buildings	50	1969	52	6	O					$3,052,500																		$3,052,500
D30	HVAC																													
D3020	Heat Generating Systems																													
D3020	Heating Boilers - Cleaver Brooks	Building A/All Buildings	35	2008	13	0	O				$92,500																			$92,500
D3020	Heating Boilers - Camus	Building A/All Buildings	20	2008	13	0	O									$305,250										$31,450				$336,700
D3020	Heating Boilers - Hydro Therm	Building C	25	2005	16	0	O											$74,000												$74,000
D3020	Heating Pumps	Building A/All Buildings	25	2000	21	0	O						$447,700																	$447,700
D3030	Cooling Generating Systems																													
D3030	Chilled Water Systems-Chillers	Building A/All Buildings	25	2005	16	0	O											$5,087,500												$5,087,500
D3030	Cooling Tower (1999)	Building A roof/Chillers	25	1999	22	0	O					$351,500												$83,250						$434,750
D3030	Cooling Tower (2004)	Building A roof/Chillers	25	2004	17	0	O										$351,500											$83,250	$434,750
D3030	Cooling Pumps	Building A/ All Building	25	2000	21	0	O											$425,500												$425,500
D3030	Direct Expansion Systems	Building C Elevator Machine Rooms	20	2016	5	0	O																	$24,050						$24,050
D3040	Distribution Systems																													
D3041	Air Distribution Systems (AHUs)	All Buildings	30	1969	52	40	O																			$14,374,500				$14,374,500
D3041	Air Distribution Systems (AHU Humidifiers)	All Buildings	20	2019	2	0	O																				$1,258,000			$1,258,000
D3041	Air Distribution Systems (AHU VFDs-Old)	All Buildings	10	2005	16	7	O			$712,250										$712,250										$1,424,500
D3041	Air Distribution Systems (AHU VFDs-New)	Buildings B & C	10	2018	3	0	O														$35,150									$35,150
D3042	Exhaust Ventilation Systems-Floor Polisher Exhaust Fan	Floor Polisher Room	30	2022	0	0	O			$20,350																				$20,350
D3042	Exhaust Ventilation Systems	All Buildings	30	1969	52	27	O							$2,035,000																$2,035,000
D3044	Hot & Chilled Water Distribution	All Buildings	50	1969	52	5	O				$5,920,000																			$5,920,000
D3047	Glycol Distribution Systems	Building C	20	2016	3	0	O																			$244,200				$244,200
D3050	Terminal & Package Units																													
D3051	Electric, Hydronic, or Fossil Fuel Unit Heaters	All Buildings	25	2017	4	0	O																							
D3052	Packaged Units-Make-up Air Units	Building C	25	1992	29	5	O			$244,200																				$244,200
D3060	Controls & Instrumentation																													
D3061	Controls & Instrumentation-BAS	All Buildings	10	2008	15	7	O				$3,561,250										$3,561,250									$7,122,500
D40	Fire Protection																													
D4010	Sprinklers																													
D4010	Sprinklers - Life Cycle Replacement	Building A	40	1990	25	0	O																	$2,477,890						$2,477,890
D4010	Sprinklers - Life Cycle Replacement	Building C	40	1990	31	0	O											$1,322,454												$1,322,454
D40	Sprinkler and Standpipe - Repair	All Buildings					O			$156,788																				$156,788
D4010	Sprinkler - Provide missing sprinkler protection	Building B and C					O													$7,575,444										$7,575,444
D4020	Standpipes																													
D4020	Standpipe - Periodic Maintenance	All Buildings					O			$44,400					$44,400					$44,400				$44,400					$177,600
D4030	Fire Protection Specialties																													
D4031	Fire Extinguishers - Periodic maintenance	All Buildings					O			$22,200					$22,200					$22,200				$22,200					$88,800
D4090	Other Fire Protection Systems																													
D4090	Kitchen Hood Suppression System - Life Cycle Replacement	Building C	25	2009	13	0	O														$122,100									$122,100
D4090	Kitchen Hood Suppression System - Life Cycle Replacement	Building A	25	1990	31	7	O			$71,225																				$71,225
D4090	FM200 Extinguishing System - Life Cycle Replacement	Building C	25	2021	24	0	O																							$0
D4090	VESDA Smoke Detection System - Life Cycle Replacement	Building B	10	2016	6	0	O							$1,034,409										$1,034,409						$2,068,818
D4090	Fire Separation and Closure - Repair	All Buildings					O			$230,755	$224,390																			$455,145
D4090	Structural Fireproofing - Repair	All Buildings					O			$124,875																				$124,875
D50	Electrical																													
D5010	Electrical Service & Distribution																													
D5010	Main Switchgear	Building A	45	1969	52	10	O				$2,492,875																			$2,492,875
D5010	Main transformer-"Chiller"	Building A	40	2005	16	0	O																							$0
D5010	Main transformers	Building A	40	2012	9	0	O																							$0
D5011	Electrical Service & Distribution	All Buildings	45	1969	52	10	O				$9,250,000					$9,250,000					$5,920,000									$24,420,000
D5020	Lighting & Branch Wiring																													
D5021	Branch Wiring & Devices	All Buildings	45	1969	52	10	O				$925,000					$925,000					$337,625									$2,187,625
D5022	Lighting Equipment-Interior Lighting	All Buildings	25	varies	varies		O							$925,000					$925,000											$1,850,000
D5022	Exterior Lighting Systems - Older	Exterior	20	1998	25	6	O			$157,250																				$157,250
D5022	Exterior Lighting Systems - Newer	Exterior	20	2021	0	0	O																						$629,000	$629,000
D5030	Communications & Security																													

* An adjustment factor of 1.65 was applied to all costs per Client's request.

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Uniformat Code	Item Name	Location and/or Area Serviced	Normal Life Expectancy	Actual or Estimated Year of Acquisition	Present Age	Adjustment To Life Expectancy	Replacement Responsibility	Level of Operation Interruption	2021 Current Year	2022 1 yr. Cost	2023 2 yr. Cost	2024 3 yr. Cost	2025 4 yr. Cost	2026 5 yr. Cost	2027 6 yr. Cost	2028 7 yr. Cost	2029 8 yr. Cost	2030 9 yr. Cost	2031 10 yr. Cost	2032 11 yr. Cost	2033 12 yr. Cost	2034 13 yr. Cost	2035 14 yr. Cost	2036 15 yr. Cost	2037 16 yr. Cost	2038 17 yr. Cost	2039 18 yr. Cost	2040 19 yr. Cost	2041 20 yr. Cost	1-20 Year Total*
D5030	Fire Alarm System - Life Cycle Replacement	All Buildings	20	1998	25	7	O				$2,879,155																			$2,879,155
D5040	Other Electrical Systems																													
D5091	Emergency Generator - Cummins	Building A/ All Buildings	35	2013	8	0	O																							$0
D5091	Emergency Generator - Kohler	Building A/ All Buildings	35	1998	25	0	O												$1,221,000											$1,221,000
D5091	Emergency Generator - Fuel Tanks	Building A/ Generators	10	2011	10	1	O			$101,750										$101,750										$203,500
D5091	Emergency Generator - ATSs	Building A/ Generators	35	1998	25	0	O												$244,200											$244,200
D5092	UPS System	Buildings A & B	10	2000	21	16	O							$153,550										$153,550						$307,100
D5093	Emergency Lighting Systems	All Buildings	20	series	varies		O		$83,250	$83,250	$83,250	$83,250	$83,250	$83,250	$83,250	$83,250	$83,250	$83,250	$83,250	$83,250	$83,250	$83,250	$83,250	$83,250	$83,250	$83,250	$83,250	$83,250	$83,250	$1,745,250
E	EQUIPMENT & FURNISHINGS																													
E10	Equipment																													
E1030	Loading Dock Equipment	Building C- Service Area	30	1968	21	1	O			$87,801																				$87,801
F	SPECIAL CONSTRUCTION & DEMOLITION																													
F1013	Roof Metal Platform	Building A - Cooling Tower Roof	50	2007	14	0	O	Low	$51,602																					$51,602
F1013	Metal Platform within Mechanical Rooms	All Buildings	50	1969	52	0	O	Low	$137,914										$137,914											$275,828
G	BUILDING SITEWORK																													
G10	Site Preparation																													
G20	Site Improvements																													
G2010	Roadways																													
G2012	Paving & Surfacing	Asphalt Roadways	25	2008	13	0	OSC	Medium													$2,314,274									$2,314,274
G2020	Parking Lots																													
G2022	Paving & Surfacing	Asphalt Paved Parking lots- North Public Parking	25	2000	21	0	OSC	Medium					$5,324,935																	$5,324,935
G2022	Paving & Surfacing	Asphalt Paved Parking Lots- South Public Parking	25	2008	13	0	OSC	Medium													$2,515,825									$2,515,825
G2022	Paving & Surfacing	Asphalt Paved Parking Lots- Staff Public Parking on East and South Side of Building C	25	2008	13	0	OSC	Medium													$1,213,199									$1,213,199
G2022	Paving & Surfacing	North service area parking of Building A and south west of Building C	25	1998	25	1	OSC	Medium			$101,849																			$101,849
G2022	Paving & Surfacing	South Service Area parking of Building A / Restoration of the suspended slab of the transformer room	25	1998	25	1	OSC	Medium		$192,001																				$192,001
G2023	Curbs, Rails & Barriers	Grates over Transformer Room's Ventilation Shaft	25	1969	52	1	O	Medium	$100,344																					$100,344
G2024	Parking Booths & Equipment	Concrete booths- North and South Parking Lots	100	1969	52	0	OSC	Medium			$76,680																			$76,680
G2030	Pedestrian Paving																													
G2031	Paving & Surfacing	Concrete Sidewalks of the Complex	40	1990	31	0	OSC	Medium		$89,422					$89,422					$89,422					$89,422					$357,687
G2031	Paving & Surfacing	Concrete Paving - Building A	40	1990	31	0	OSC	Low		$850,834																				$850,834
G2031	Paving & Surfacing	Unit Paved Walkways of the Complex	40	1969	52	0	O	Low		$1,139,437																				$1,139,437
G2033	Exterior Steps/Stairs	Site	100	1969	52	0	O	Medium		$150,516																				$150,516
G2033	Exterior Steps/Stairs	Stair Guardrails	40	1969	52	0	O	Medium		$66,896																				$66,896
G2033	Exterior Steps/Stairs	Concrete Stairs of Building B	100	1969	52	0	O	Medium		$17,247					$17,247					$17,247					$17,247					$69,987
G2033	Exterior Steps/Stairs	Concrete Stairs of Building B	100	1969	52	0	O	Medium		$51,740					$51,740					$51,740					$51,740					$206,960
G2040	Site Development																													
G2041	Fences & Gates	Wooden Barrier/ Rails- Natural Walkway Between Building B and Building C and Surrounding Building B	40	1969	52	0	O	Low	$103,020																					$103,020
G2041	Fences & Gates - Below Threshold	Chain Link Fencing	40	2000	21	1	OSC	Low																						
G2042	Retaining Walls - Below Threshold	Pre-Cast Concrete Retaining walls of Building B	40	2012	9	0	O	Low																						
G2042	Retaining Walls	Concrete Retaining Walls of the Facility	40	1969	52	0	O	Low		$172,466					$172,466					$172,466					$172,466					$689,865
G2043	Concrete Ramps	Concrete Ramps- Building C	80	1969	52	0	O	Medium								$252,532														$252,532
G2044	Signage	Outside Building A	100	1995	26	0	O	Medium		$86,233															$86,233					$172,466
TOTALS (Uninflated)									**$1,023,694**	**$31,087,398**	**$32,778,796**	**$17,688,565**	**$9,760,461**	**$21,199,541**	**$8,861,013**	**$15,753,294**	**$791,434**	**$15,819,934**	**$7,994,729**	**$15,028,711**	**$16,359,176**	**$701,330**	**$6,663,807**	**$3,917,609**	**$2,890,832**	**$16,675,599**	**$1,697,934**	**$1,914,899**	**$860,250**	**$228,445,312**
	Inflation Rate	**2.5%**								**1.000**	**1.025**	**1.050**	**1.075**	**1.100**	**1.125**	**1.150**	**1.175**	**1.200**	**1.225**	**1.250**	**1.275**	**1.300**	**1.325**	**1.350**	**1.375**	**1.400**	**1.425**	**1.450**	**1.475**	
										$31,087,398	**$33,598,264**	**$18,572,994**	**$10,492,496**	**$23,319,495**	**$9,968,640**	**$18,116,288**	**$929,935**	**$18,983,921**	**$9,793,543**	**$18,785,888**	**$20,857,950**	**$911,729**	**$8,825,544**	**$5,288,772**	**$3,974,894**	**$23,345,839**	**$2,419,596**	**$2,776,603**	**$1,269,869**	**$263,322,619**

* An adjustment factor of 1.65 was applied to all costs per Client's request.

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Appendix F

Environmental Scan

ONTARIO SCIENCE CENTRE RELOCATION

Environmental Scan - Revised

January 16, 2023

Lord Cultural Resources

Lord Cultural Resources is a global professional practice dedicated to creating cultural capital worldwide.

We assist people, communities and organizations to realize and enhance cultural meaning and expression.

We distinguish ourselves through a comprehensive and integrated full-service offering built on a foundation of key competencies: visioning, planning and implementation.

We value and believe in cultural expression as essential for all people. We conduct ourselves with respect for collaboration, local adaptation and cultural diversity, embodying the highest standards of integrity, ethics and professional practice.

We help clients clarify their goals; we provide them with the tools to achieve those goals; and we leave a legacy as a result of training and collaboration.

Our Toronto office is located within the traditional territory of many nations, including the Mississaugas of the Credit, the Anishnabeg, the Chippewa, the Haudenosaunee and the Wendat peoples. Toronto is home to many diverse First Nations, Inuit, and Métis peoples. Our New York office is located on the traditional lands of the Lenape peoples. We encourage you to acknowledge the presence of the people who came before, wherever you are.

Table of Contents

BACKGROUND

Lord Cultural Resources has been commissioned by Infrastructure Ontario to explore a reimagined Ontario Science Centre, including potential relocation, as an opportunity to achieve both the OSC's modernization and sustainability objectives, and the government's vision for Ontario Place as an exciting, year-round destination for local and international visitors alike.

CONTENTS OF REPORT

The following Interim Report includes:

1. Findings from Environmental Scan – North American and international examples

1. ENVIRONMENTAL SCAN - KEY FINDINGS

This section focuses on the key findings from the review of available published data regarding other selected science centres in North America, Europe and Asia. This environmental scan is provided to inform the consideration of the potential relocation of the Ontario Science Centre (OSC) to a new site at Ontario Place.

The science centres examined in this scan were selected on the basis of context – market size and location - with respect to a relocated science centre at Ontario Place. Therefore, criteria for selection is as follows:

1. Science centres located in large regional population markets – in Canada – 1,000,000 and above in population; in the US – 2,000,000 and above in population; in Europe and Asia – 1,000,000 and above in population.
2. Science centres located in the downtown and/or waterfront locations.
3. Other science centres located in densely populated areas just outside the downtown - Parc de la Villette and Pudong respectively – as precincts widely visited by both residents and tourists.

The scan was organized as follows:

1. North America
   - Canadian cities (Montreal, Vancouver, Edmonton and Calgary)
   - Waterfront science centre sites in U.S. cities (Pittsburgh, Columbus, San Francisco, Cleveland, Chicago, Boston, Portland, Miami)
   - Other larger city downtown science centres in the United States (Phoenix, Los Angeles, Charlotte, Seattle, Dallas, Philadelphia)
2. International
   - Europe (Glasgow, Paris, Copenhagen, Amsterdam, Wolfsburg, Bremen, Valencia, Lisbon, Munich)
   - Asia (Shanghai, Singapore)

Detailed tables for all of the selected science centres are set out in Appendix A, each in comparison to data for the Ontario Science Centre.

KEY TAKEAWAYS

The analysis of the environmental scan revealed the following areas of consideration for modernising and relocating the OSC at Ontario Place:

1. Size of building and exhibition spaces – the shift from large to small
2. Large format/dome theatres and planetariums
3. Outdoor programming
4. Revenue Generation
5. Expanded Audiences
6. Broadened Reach
7. Virtual Experiences
8. Partnerships
9. Physical Experience
10. Waterfront Location

1. SIZE OF BUILDING AND EXHIBITION SPACES-THE SHIFT FROM LARGE TO SMALL

Most of the science centres examined both within North America and Europe are considerably smaller than the current Ontario Science Centre, with median sizes in the 237,000 to 287,000 sq.ft. range and a ratio of permanent and temporary exhibition space to overall building size between 39% to 45% compared to 25% for the existing Ontario Science Centre. This indicates a maximization of exhibition space and efficiency of ancillary spaces. The shift from large to small, particularly in the last 20 years, reflects a changing philosophy as science centres want to be more nimble, flexible, innovative and risk taking.

- The existing Ontario Science Centre is in a very large building at 568,000 sq.ft., ranking it second largest among science centres compared in North America.
- The median size of US waterfront science centres is 287,000 sq.ft.,and 237,000 sq.ft. for US downtown science centres, about half and more than half of the current OSC respectively.
- The current OSC is approximately four times the median size of science centres (131,000 sq.ft) in Canada.
- The Ontario Science Centre currently offers 153,000 sq. ft. of exhibition space (139,000 sq.ft. of which is permanent exhibition space), which is substantially larger than the other Canadian science centres and only somewhat larger than the median exhibition space sizes for the US waterfront, other downtown science centres and international science centres.
- The inefficiency of the OSC building size is seen in the ratio of exhibition space to building size at 27% (total exhibition space) compared to 39% for Canadian and U.S. waterfront science centres

and 45% for other larger downtown science centres. The higher percentage (exhibition space to overall size of building) indicates a greater efficiency of building.

IMPLICATIONS TO A RELOCATED ONTARIO SCIENCE CENTRE AT ONTARIO PLACE

The data confirmed that a relocated Ontario Science Centre at Ontario Place may be substantially smaller than the current facility. The reduction should focus on increasing the ratio of exhibition space to building area, similar to other downtown and waterfront science centres in the US as exhibition spaces influence admission charge levels, length of stay, repeat visitation attendance and membership levels and associated revenues.

2. LARGE FORMAT/DOME THEATRES AND PLANETARIUMS

All of the science centres in North America have large format or dome theatres, particularly older centres. Only one of the European centres examined have large format theatres – Glasgow Science Centre - and many of those centres that present astronomy or outer space do so without dome theatres - except for the Copernicus Science Centre in Warsaw.

- Although large format (IMAX/other) and dome theatres are not as popular as in the past, all but the Frost Museum of Science features a large format theatre of the North American examples. Instead of a large format theatre, the Frost decided to focus on a planetarium as well as a large aquarium.
- Of all the international science centres examined, only the Shanghai Science and Technology Museum has a large format theatre. In fact, the museum has multiple theatres including two dome theatres, a 3D theatre and a 4D theatre catering to a local market that is 4 times that of the Toronto CMA.
- None of the European science centres have large format theatres, and only the Copernicus Science Centre in Warsaw has a domed-ceiling planetarium which also serves double duty as a cinematic theatre and a venue for live music. A phenomenon pioneered by the Franklin Institute in Philadelphia is to have a flat floor planetarium with moveable seats allowing the maximum flexibility for events and 3rd party rentals.

IMPLICATIONS TO A RELOCATED ONTARIO SCIENCE CENTRE AT ONTARIO PLACE

The current OSC has both a very small planetarium with a capacity of 50 and a 324 seat IMAX OMNIMAX Dome. With the potential relocation to Ontario Place, the OSC will inherit the 614 seat Cinesphere. Larger than its current OMNIMAX Dome, the OSC may want to investigate how it can make the Cinesphere a multi-functional space that can present mission-driven and non-mission driven programs (i.e. films) as well as a space for third party functions and events.

3. OUTDOOR PROGRAMMING

An increasing number of science centres and children's museums are seeking to incorporate outdoor exhibitions and play spaces as part of the visitor experience, but they are often constrained by site limitations - particularly for the downtown locations. Outdoor programs offer unique programming experiences (regardless of climate) that the indoors cannot match. Also, the recent global pandemic has prompted more cultural institutions, including science centres, to place more emphasis on outdoor spaces where the virus is less likely to spread and greater physical distancing can occur.

- The OSC currently offers the Cohon Family Nature Escape while Telus Spark in Calgary features the very popular outdoor Brainasium, which is accessible only through the Centre.
- Outdoor spaces are increasingly being used by science centres for programming, learning and demonstration. *Energetics* at the NEMO Science Museum in Amsterdam consists of interactive sculptures and installations related to the environment and sustainable energy. Gallery 5 at Exploratorium in San Francisco is an outdoor gallery space that uses both land and water (Exploratorium is located at the waterfront) for changing exhibitions.
- Some science centres use outdoor spaces specifically for younger children for play-based learning. Columbus's Center of Science and Industry (COSI) has the Big Science Park, an outdoor laboratory featuring activities that enable children to learn about simple machines.
- Science centres with limited outdoor space are seeking to use terraces and rooftops for programming. Experimentarium in Copenhagen, for example, has fitted its rooftop with interactive play equipment that combines exercise with technology, math and music. The Copernicus Science Center in Warsaw has a rooftop garden that not only features a beautiful array of plants, it also serves as a green roof contributing to the energy efficiency of the building.
- Bremen's Universum has a large outdoor area, over 50,000 sq.ft. focused on wind and water. It includes climbing walls, crawl tunnels and many other exhibits for children. The 90 foot "Tower of Air" not only provides amazing views of the city but is also used for experiments.
- Science centres also use outdoor spaces and rooftops for revenue generation opportunities for third party rentals. The Franklin Institute in Philadelphia, the Perot in Dallas and the Frost in Miami all have very successful outdoor rooftop/terrace facilities for events and functions.

IMPLICATIONS TO A RELOCATED ONTARIO SCIENCE CENTRE AT ONTARIO PLACE

An opportunity for the OSC to consider is to use the outdoor (potentially land and water) area surrounding the pods and new building as exhibition, programming and play space. The rooftop of the pods and potentially on the new building could also serve as programming space with green roof features in addition to venue rental opportunities given the unparalleled views of the waterfront and cityscape available from Ontario Place.

4. REVENUE GENERATION

The education-focused mission of science centres mean that none operate on the basis of earned income alone. All require financial support from private and government sources. In the United States it is primarily private support – 30%-35%, with approximately 8%-10% from public sources. In Canada and internationally, most operating funds come from public sources except for Science World in Vancouver, which receives less than 4% of its income from government.

- All of the science centres charge admission for exhibitions with the exception of the California Science Center in Los Angeles, which receives substantial support from state government (very rare among U.S. science centres). All charge for large format or IMAX theatres. Planetarium shows are usually included with the price of admission, with the exception of those offering periodic laser rock shows.
- All of the science centres examined receive income through third party rentals - an essential component of earned revenue. Rentals include specific spaces dedicated to outside functions and events as well shared spaces such as auditoriums and gallery spaces. Many science centres also rent out spaces for outside conferences and corporate meetings.
- Memberships are a significant source of income for most of the science centres examined and important attendance drivers. Science centres offer many types of membership levels mostly tailored to families. Columbus's Center of Science and Industry goes beyond the family-related membership as do many others to include single adults in an effort to broaden its visitor base.
- Revenue from private sources – donations and sponsorships – average approximately 5% of total revenue for the Canadian science centres examined. Science centres in the US receive substantially more in private donations, averaging 32%-35% of total revenue. The Ontario Science Centre is well above the Canadian average with 13% of total income through donations and sponsorships.
- Many science centres in Canada and the US have established foundations that support specific initiatives including exhibitions and education, but also for ongoing operations. The Montreal Science Centre's foundation for example has contributed to the development of three new permanent exhibitions and its annual science festival Eurêka! in just the last 6 years.
- Retail and food service is offered at all of the science centres examined in North America and in Europe and Asia. Most of the science centres offer at least two types of eating experiences: one is a dining experience - in some instances upscale - and the other is a casual, fast food, cafeteria style or "grab and go", catering to kids and families. Some of the larger science centres, including Chicago, Boston and Paris, have several eating options. All of the waterfront science centres have restaurants that overlook the water and are often rented out for private functions.

  Every science centre has a gift shop offering books and science-related merchandise. Each retail outlet has a physical presence within the museum in addition to online offerings.

IMPLICATIONS TO A RELOCATED ONTARIO SCIENCE CENTRE AT ONTARIO PLACE

Available data for the Ontario Science Centre indicates earned income at 33% of operating revenues. This percentage is well below the average and median figures for Canadian, US waterfront and downtown museums and suggests that a relocation has an opportunity not only for a more attractive site but is also an opportunity to renew the exhibitions and visitor experience. As well, an Ontario Place location would be more attractive for venue rentals than

its current location for corporate and private functions and events, creating opportunities for increased earned income. With a new building, new vision and new waterfront location at Ontario Place, OSC should be able to maintain and potentially increase its current level of donations and sponsorship.

While retail and food service are not typically significant net revenue generators, they are an important guest amenity and contribute to the overall visitor experience. The OSC will need to evaluate what other food service will be offered at the reimagined Ontario Place to determine its food offerings. Similarly, the OSC will also have to determine the type of retail experience it wishes to have at the new location and align it with the overall new vision of the Centre.

5. EXPANDED AUDIENCES

Most science centres, including the ones examined as part of this scan, cater mostly to families with children largely between the ages of 5 to 12. Some science centres, including the OSC, include children's museum elements for younger learners under the age of 5. Many science centres are recognizing the need to broaden the market and engage "lost audiences" – teenagers and young adults who may not visit a science centre again until they have children.

- Many science centres offer specific programs and access for adults. The Center of Science and Industry in Columbus has COSI After Dark and COSI Discovery Nights, providing adults with their own designated time at COSI. "It's COSI without the kids."
- The Boston Museum of Science has created *SubSpace*, a program that offers adult-centric experiences through the collision of art, science and technology. Programs include live performances, art installations, and immersive and multimedia experiences.
- Exploratorium in San Francisco offers targeted memberships for young adults. Exploratorium After Dark brings together a like-minded community of the "engaged, inquisitive, and adventurous" to participate in immersive exhibits and unique programs.
- The Frost Museum in Miami provides opportunities for teenagers to explore, experiment and actively engage in activities with citizen science through its MUVE (Museum Volunteers for the Environment) program. Arizona Science Center's Teen Advisory Board works closely with the Center's leadership team to develop, test, and implement content, programs, and special events targeted to teens ages 12-18.
- Pacific Science Center in Seattle operates the Mercer Slough Environmental Education Center dedicated to inspiring future stewards of the environment through hand- on programs for teens. The program focuses on being outside and thinking critically about issues that affect the human and natural communities.
- COSI also offers *little kidspace*, designed and staffed by early education experts for children from birth through first grade. Little kidspace promotes learning in a colorful and engaging atmosphere for little hands and growing minds. The Perot Museum of Nature and Science also includes a specific area of the museum for children under 5.

IMPLICATIONS TO A RELOCATED ONTARIO SCIENCE CENTRE AT ONTARIO PLACE

The analysis suggests opportunities for a new site at Ontario Place to have a positive impact on attendance by widening the market to include more adults not accompanying children, teens, younger learners (as Toronto does not have a children's museum) and more tourists. Increasing attendance should lead to more visitor-generated income and earned income, especially venue rentals at Ontario Place.

6. BROADENED REACH

Some science centres recognize that not all visitors are able to come to their centre or may not be want to come – either because of distance, economics, social factors and interest – that is, science is "not for me." Some science centres in the US and UK have sought to reach out to marginalized groups and communities and engage with potential visitors who may not otherwise be interested in science.

- The Glasgow Science Centre has developed an outreach program that physically brings workshops, live science shows and interactive exhibits to classrooms across Scotland. The Arizona Science Center in Phoenix delivers hands-on, grade-specific programs to audiences large and small throughout the community that supports Arizona College and Career Readiness Standards.
- Exploratorium in San Francisco has developed Community Educational Engagement programs that offer family science nights at schools, work with individual patients at the city's children's hospital and participate in neighborhood events. These programs bring interactive, hands-on science activities to multigenerational audiences in settings primarily within their own communities.
- Community Youth Programs through the California Science Center in Los Angeles aim to stimulate curiosity and inspire science learning among underserved local youth in the greater LA area through hands-on educational opportunities and personal development experiences during the academic year and summer.
- Carnegie Science Center's STEM Excellence Pathway is a free strategic planning process developed by the Center that helps school systems, individual schools, departments and teachers improve their STEM education practices and adopt best practices in STEM learning.

IMPLICATIONS TO A RELOCATED ONTARIO SCIENCE CENTRE

As the "Ontario" Science Centre, the OSC will strive to reach beyond its physical boundaries to not only serve neighbouring communities within Toronto and the Greater Toronto Area but also the communities across the province. Broadened reach also refers to engaging with audiences who may feel the OSC is not for them. Greater reach can be achieved virtually and physically through interdisciplinary programs, community partnerships and collaborations, and training.

7. DIGITAL EXPERIENCES

Digital engagement, programming and outreach is critical to the operation and 21st Century learning for all museums and for science centres in particular. Digital engagement is not a nice-to-

have add-on to what science centres are doing physically, but instead should be considered an indispensable component of the overall omnichannel visitor experience. The current global pandemic has, in fact, revealed where science centres in North America and internationally have excelled in the digital realm and where others have fallen short.

- Center of Science and Industry has developed COSI Connects, a "digital doorway" for fun at-home science discovery and learning. Everyday, COSI posts "fresh, exciting and engaging science" through videos and hands-on science that can be done with the family. Similarly, the Museum of Science and Industry in Chicago has developed online programs and experiments for kids using everyday objects found at home.
- Lisbon's Pavilhão do Conhecimento has developed a website where families will find hands-on science activities to try at home, short talks by scientists, one-minute podcasts for children and book suggestions available on-line.
- The Museum of Science in Boston has developed a suite of activities that produces engineering and computer science in-school curricula, and is currently developing a virtual learning series that will adapt hands-on learning into remote spaces. Frost Science in Miami has created virtual field trips bringing the physical experience of the museum into classrooms across the county.
- Perot Museum of Science and Nature provides an online teacher guide developed by the Museum to aligns with the state-wide science curriculum - Texas Essential Knowledge and Skills (TEKS).

IMPLICATIONS TO A RELOCATED ONTARIO SCIENCE CENTRE AT ONTARIO PLACE

As the OSC develops its new vision, it should continue to build the digital realm as an integral part of this reimagining. This would include not only digital engagement within the building but online resources (as it has been doing) and virtual applications as well to extend reach and experience.

8. PARTNERSHIPS

Nearly all of the science centres in this scan actively collaborate with outside partners as a way to build support for the institution, develop content and engage with audiences. Science centres seek partners for funding, programming, research, learning and many other opportunities.

- Exploratorium works with **science agencies** as major partners for research and content. These agencies include NASA and National Oceanic and Atmospheric Administration.
- Exploratorium also seeks partners beyond its home. It reaches out across cultures and continents with **global partners** to broaden its influence on formal and informal learning.
- Columbus's science centre – COSI - has developed a major **research partnership** with Ohio State University (OSU), one of the US's largest public research universities. COSI and OSU have created a "center of science" at COSI where research, science, and university outreach are embedded into the fabric of everyday public, student, and family experiences.
- COSI also partners with the local **education** system through the Educator Advisory Board (EAB) established as a non-governing board comprised of local, regional, and state educators representing public, private, and charter schools, after-school programs, libraries, and other educational organizations and institutions. EAB members are committed to advocating for the complementary role of formal and informal education and for COSI as an educational resource.

- Many science centres, primarily in the US, work closely with **foundation partners**. The Museum of Science and Industry in Chicago provides foundations with the opportunity to partner with an established community advocate and leader in science education.

IMPLICATIONS TO A RELOCATED ONTARIO SCIENCE CENTRE AT ONTARIO PLACE

It will be important for the OSC to continue to develop partnerships within the city, province and globally. These partnerships will be essential to support the OSC's programming, education and learning, research and other initiatives as it reimagines its future at Ontario Place.

9. PHYSICAL EXPERIENCES

All of the science centres studied present a similar type of visitor experience – hands-on interactive exhibits that communicate scientific principles – a model created by Exploratorium and the Ontario Science Centre in the late 1960's. Citing a number of sources including the *International Strategy 2018-2022 Extending Reach, Growing Reputation and Building Resource* by the UK's Science Museum Group and Michael John Gorman's *Idea Colliders: The Future of Science Museums*, there is a movement underway to reimagine the science centre experience to become more participatory in approach where the visitor of various backgrounds and disciplines contribute to the content and co-creation – a collision of ideas and experiences that "connect the unexpected". It should be noted that the science centres examined in the scan have not adopted this approach, however, this movement is important to include in this scan.

IMPLICATIONS TO A RELOCATED ONTARIO SCIENCE CENTRE AT ONTARIO PLACE

The current OSC experience is similar to the one described above – one that it had pioneered over 50 years ago. As the OSC reimagines its future it will assess what has been successful in the past balanced with what it believes to be the future of science engagement for the next generation of lifelong visitors.

10. WATERFRONT LOCATION

The redevelopment of waterfronts over the last several decades have been key to urban revitalization efforts (for those cities with waterfronts) across the globe. In recent years the strategy plans that are shaping today's cities have reflected a clear growth in interest in the waterfront, that border between city and water – be it river, lake, sea or ocean. Commercial, leisure, recreational and cultural activities activate and animate waterfronts around the world attracting residents and tourists alike.

For that reason many science centres are located at waterfronts and they are often part of a cultural or mixed-used precinct. Of all the waterfront science centres studied in this scan, it is interesting to note that only one, Exploratorium in San Francisco, integrates water into its programming. All others use the waterfront as site appeal to attract residents and tourists to the area and also as a backdrop for restaurants and premium venue rentals.

IMPLICATIONS TO A RELOCATED ONTARIO SCIENCE CENTRE AT ONTARIO PLACE

Ontario Place is one of the premiere waterfront locations in the world. As the site is revitalized with leisure, recreational and cultural uses (including the relocation of the OSC), Ontario Place will be one of the great destinations for residents of Ontario and for tourists. While the OSC will certainly be able to take advantage of its new site in terms of visitation, restaurant or café use and venue rental opportunities, it may also consider how Lake Ontario can be incorporated into its programming and exhibitions.

Environmental Scan – Canada and USA

Confidential and Privileged Advice to Government

		Larger City Canadian Science Centres						US Waterfront Science Centres										US Downtown Science Centres							
Name	Ontario Science Centre	Montreal Science Centre	Science World	TELUS Spark	Telus World of Science	Average	Median	Carnegie Science Center	COSI - Center of Science and Industry	Exploratorium	Great Lakes Science Center	Museum of Science and Industry, Chicago	Museum of Science	Oregon Museum of Science and Industry	Phillip/Patricia Frost Museum of Science	Average	Median	Arizona Science Center	California Science Center	Discovery Place Science	Pacific Science Center	Perot Museum of Nature and Science	The Franklin Institute	Average	Median
																									
Location	Toronto, ON, CAN	Montreal, QC, CAN	Vancouver, BC, CAN	Calgary, AB, CAN	Edmonton, AB, CAN			Pittsburgh, PA, USA	Columbus, OH, USA	San Francisco, CA, USA	Cleveland, OH, USA	Chicago, IL, USA	Boston, MA, USA	Portland, OR, USA	Miami, FL, USA			Phoenix, AZ, USA	Los Angeles, CA, USA	Charlotte, NC,USA	Seattle, WA, USA	Dallas, TX, USA	Philadelphia, PA, USA		
Region Served	Toronto CMA	Montreal CMA	Vancouver CMA	Calgary CMA	Edmonton CMA			Pittsburgh MSA	Columbus Metro Area	San Francisco-Oakland-Hayward MSA	Cleveland-Elyria	Chicago-Naperville-Elgin	Boston-Cambridge-Newton MSA	Portland-Vancouver-Hillsboro	Miami-Fort Lauderdale-West Palm Beach			Phoenix-Mesa-Scottsdale MSA	Los Angeles-Long Beach-Anaheim	Charlotte--Concord--Gastonia MSA	Seattle-Tacoma-Bellevue	Dallas-Fort Worth-Arlington	Philadelphia-Camden-Wilmington		
CMA/MSA Population	5,928,040	4,098,927	2,463,431	1,392,609	1,321,426			2,324,743	2,106,541	4,729,484	2,057,009	9,457,867	4,875,390	2,478,996	6,198,782			4,857,962	13,291,486	2,569,213	3,939,363	7,540,371	6,096,372		
Location within City	Suburban	Waterfront	Waterfront	Close to Downtown	Suburban			Waterfront	Waterfront	Waterfront	Waterfront	Waterfront	Waterfront	Waterfront	Waterfront			Downtown	Downtown	Downtown	Downtown	Downtown	Downtown		
General Institution Information																									
Founded	1969	2000	1989	1967 (As Calgary Science Centre)	1984			1991	1964	1969	1988	1926	1830	1944	1949			1984	1951	1981	1962	1936	1824		
Mission	To inspire passion for the human adventure of discovery	Dedicated to the promotion and development of literacy, innovation and careers in science and technology.	Through science and nature, we ignite wonder and empower dreams.	Spark brings people together to learn, play and create with science, technology, engineering, arts and math (STEAM).	Ignite Curiosity. Inspire Discovery. Celebrate Science. Change Lives.			Carnegie Science Center delights, educates, and inspires through interactive experiences in science and technology.	To engage, inspire, and transform lives and communities by being the best partner in science, technology, and industry	Our mission is to create inquiry-based experiences that transform learning worldwide.	Our mission is simple: to make science, technology, engineering and math come alive.	To inspire the inventive genius in everyone.	The Museum's mission is to play a leading role in transforming the nation's relationship with science and technology.	OMSI's mission is to inspire curiosity through engaging science learning experiences, foster experimentation, and the	Frost Science inspires and connects people of all ages and backgrounds to enjoy science and technology, and to better			To inspire, educate and engage curious minds through science.	We aspire to stimulate curiosity and inspire science learning in everyone by creating fun, memorable experiences,	We inspire curious thinkers to discover the wonders of science, technology and nature.	Pacific Science Center ignites curiosity in every child and fuels a passion for discovery, experimentation, and	Perot Museum of Nature and Science	In the spirit of inquiry and discovery embodied by Benjamin Franklin, the mission of The Franklin Institute is to inspire a		
History	The Ontario Science Centre opened on September 26, 1969. The centre was a gift from provincial government to the public to mark Canada's Centennial. Architecture Raymond Moriyama was commissioned in 1964 to design the centre which at the time was one of the world's first interactive science museums. Since opening in 1969, the centre has welcomed over 54 million visitors.	The Montreal Science Centre is dedicated to science and technology. Known for quality exhibition, the centre focuses on the use of interactive devices creating an innovating environment for entertaining and education.	Science World focuses on addressing contemporary issues that intersect science and society. Pressing issues that concern the organization include equity, community collaboration, ecological sustainability, and our future. Science world is continuing to grow its education program to holistically address all areas of STEAM.	Telus Spark's mandate is to integrate art and creativity in innovative ways to engage people in science, technology, engineering, and math. The centre houses interactive exhibitions, multimedia presentation, and hosts education demonstrations to fulfill this mandate.	Located in Edmonton, Alberta, TELUS World of Science is a broad-based science centre with the mission to "Ignite curiosity. Inspire discovery. Celebrate science. Change lives." The centre aims to engage all Albertans in science through heart and mind. Edmonton Space & Science Foundation operates TELUS World of Science.			Located on the North Shores of the Ohio River, Carnegie Science Center opened on October 5, 1991. Carnegie Science Center was formed when two institutions, Carnegie Institute (est. 1895) and The Buhl Planetarium and institute of Popular Science (est. 1939) merged to form one science center. Both boards approved the merger in 1987, and in 1989 ground was broken for the center's current location. The Henry Buhl Jr. Planetarium and Observatory was reimaged and became a focal point of the new facility.	Located in Central Ohio, COSI is a nationally recognized science center. The center opened to the public in March 1964, welcoming over 5,000 guests with adult admissions of 50 cents and youth admission of 25 cents. For 35 years, the center was located in Memorial Hall before moving to its downtown Columbus location in November 1999. The current facility includes 300+ interactive experiences, a dedicated children's gallery, Planetarium, and nine galleries. Since opening, COSI has welcomed over 36 million visitors.	Exploratorium was founded in 1969 by professor and physicists, Frank Oppenheimer. Oppenheimer, who was the Museum's director until 1985, worked with artists, developers, and educators to create visitor focused exhibitions. Initially located at the Palace of Fine Arts, Exploratorium moving to Piers 15 and 17 on San Francisco's Embarcadero in April 2013. Exhibitions are housed in Pier 15 while Pier 17 houses administrative spaces and has the potential for future expansion. Exploratorium remains focused on hands-on investigation and inquiry-based science.	Great Lakes Science Center opened in July 1996. The center focuses on STEM with exhibitions on space, energy, and biomed tech. In 2006, the center installed a wind turbine in its front yard which provides roughly 7% of the center electrical needs annually. The following year, a 300-foot solar panel canopy was installed providing enough energy to light to the center's exhibition space for hour. In 2010, the NASA Glenn Visitor Centre relocated to the Great Lakes Science Center, hosting space related exhibits, programs, and events.	The Museum of Science and Industry is the Western Hemisphere's largest science Museum. The Museum is housed in the Palace of Fine Arts building which was built in 1893 for the World's Columbian Exposition. The Museum of Science and Industry opened onsite in 1933. Today, the building houses over 400,000 square feet of exhibit space, a five-story domed theater, an 800-seat auditorium, and 13 learning labs. Since opening, the museum has welcomed over 190 million guests. In October 2019, it was announced that the Museum would be renamed to the Kenneth C. Griffin Museum of Science and Industry after the largest single gift donation in the museum's history from billionaire Kenneth C. Griffin.	The Museum of Science was initially founded as the Boston Society of Natural History in 1830. When the Society moved in 1864, it was renamed the New England Museum of Natural History. After outgrowing its facility, the museum moved to its current location in Science Park on the Charles River and was renamed the Boston Museum of Science and eventually the Museum of Science. Today the Museum permanent exhibits cover subjects such as minerals, plants, space, computers, biology, electricity, and houses the Charles Hayden Planetarium, built in 1958.	OMSI's history dates to 1896 with the opening of an exhibition on natural resources at Oregon's City Hall. With the World Wars and Great Depression, the museum did not receive support until the mid-forties. The museum was officially founded in 1944 and was temporarily hosted by businessman Ralph Lloyd at this home. A dedicated museum was constructed in 1958 on City leased property Washington Park. Having outgrown its Washington Park location, OMSI moved to its current state-of-the-art science center facility in 1992. Today, OMSI has an international reputation for innovative education programs and exhibits.	The Phillip and Patricia Frost Museum of Science was founded in 1949 when a group of women in the Junior League of Miami recognized the need to for dedicate science museum in the region. The League procured a private house in 1950, establishing the Junior Museum of Miami. With population expansion and increased visitors, an independent Miami Museum of Science opened to the public in1960. Popularity of the Museum continued to go along with Miami's population and in November 2004, county voters passed a bill to create a new Miami Science Museum. Ground broke on the 250,000 square foot facility in February 2011. The			Arizona Science Center opened in 1984 as the Arizona Museum of Science and Technology. The center was initially located in a downtown storefront and moved to the center's current permanent location in 1997. A travelling exhibition space and dedicated classroom were added during a 1998 expansion. Today, the facility it located in downtown Phoenix's Heritage and Science Park and welcomes over 510,000 visitors annually.	The center's history dates to 1912 when the first State Exposition Building opened displaying agriculturally-based natural resources and industrial materials from across California. Post WWII, the Exposition Building was remodeled to meet the needs of new growing technology-based businesses and to show visitors the role of science and technology in daily life. In 1951, building was renamed the California Museum of Science and Industry. In transitioning into a public institution for science learning, the center opened in a new 245,000 square foot facility in 1998 and was rebranded as the California Science Center. In 2010, a Phase II expansion was completed	In 1946, teacher Laura Downes began collecting live specimens used to open a small community museum. As the collection grew, the Junior League of Charlotte set out to create a Children's Nature Centre with a hands-on approach and in 1951, Charlotte Nature Museum opened to the public. The museum outgrows is site, and in 1981 a new museum, Discovery Place opened a 72,000 square foot facility. In 1986, the facility expanded to include swelling exhibits and an IMAX Dome Theatre in 1991. In 2010, Discovery place underwent a major $31.6 million renovation to incorporate state-of-the-art labs and interactive	Pacific Science Center's history dates to 1962 when a United States Science Pavilion was displayed at the Seattle World's Fair. After the fair, the buildings and land were leased to the Pacific Science Center for $1.00 per year, making the museum the first science and technology center in the United States. In 2004, the center officially took ownership of the land when the title deed was signed over to the center's foundation. The center was declared an official City of Seattle Landmark in July 2010 and in October 2012, the center celebrated its 50-year anniversary. Pacific Science Center serves nearly a million people onsite and offsite each	Perot Museum of Nature and Science is the result of the 2006 merger between the Dallas Museum of Natural History (est. 1936), The Science Place (est. 1949), and the Dallas Children's Museum (est. 1995). By combining the collections of the three institutions, Perot Museum now houses exhibitions and offers education programs for audiences from early childhood to life-long learners. With a $50 million contribution in 2008 by Margot and Ross Perot's five adult children, fundraising surpassed $100 million and construction commenced on a new facility in 2009. The museum was renamed the Perot Museum of Nature and Science in	The Franklin Institute of the State of Pennsylvania for the Promotion of the Mechanic Arts was established in October 1824. Funded by community contributions, a new museum building opened to the public in 1934 and was one of the country's first museums to take a hands-on approach to learning about the physical world. In 1990, 2003, and 2012, major capital campaigns took place to expand the existing facility which today contains over 400,000 square feet of exhibition space, an IMAX Theater.Planetarium, two auditoriums, and the restored Benjamin Franklin National Memorial. In 2014, the Institute opened the Nicholas and Athena		
General Description	As one of Ontario's most significant cultural attractions, the Ontario Science Centre welcomes visitors of all ages to learn-through-play and encourages visitors to explore ways to think like a scientist. Steered by a mission to "inspire passion the human adventure of discovery" the centre's team builds, rents, and sells world-class exhibitions globally. The centre blends science, technology, and innovation while supporting and encouraging community dialogue to create a better future for our society, planet, and to create a more curious, and resilient world.	Located on the King Edward Pier in Old Port of Montreal, Montreal Science Center was established in 2000 as the iSci Centre. The Centre is managed by the Old Port of Montreal Corporation, a division of Canada Lands Division Company, a crown corporation of the Canadian federal government. In 1997, the Old Port of Montreal Corporation began developing the central portion of the site which has since became an attraction with cultural, social, and economic development benefits. In 2002, the centre was renamed to the Montreal Science Centre.	Science World is housed in Vancouver's Expo Centre. In celebration of Vancouver's 100th birthday, the city held a six-month transportation-themed world fair in 1986 that attracted over 22 million visitors, launching Vancouver as a global destination. The Expo Centre underwent extensive retrofitting to be transformed into Science World which included Canada's first Omnimax theatre. Science World officially in 1989.	In 1967, Calgary Science Centre opened in this city's downtown west-end. The Centre was rebranded has the Telus World of Science – Calgary in 2005. In 2011, the centre moved to its current Nose Creek Valley location and was renamed TELUS Spark. With the 2011 move, TELUS Spark became the first purpose-built science centre in Canada in 25 years. Today, the centre houses the largest dome theatre in Western Canada and emphasizes science, technology, and innovation.	Edmonton Space Sciences Centre opened on July 1, 1984. The facility has undertaken major renovations including a $14 million renovation in 2001 with subsequent smaller upgrades in 2011, 2012 and 2013 when a new state-of-the-art IMAX theatre opened to the public. From 2016 to 2018, the Aurora Project was undertaken by the Centre, resulting in facility upgrades that included New Purple Restaurant and a world-class planetarium. In 2005, the Centre was rebranded as TELUS World of Science.			By connecting science and technology with daily life, Carnegie Science Center inspires visitors. The center hosts outreach programs serving Pittsburgh's diverse community. In 2003, the center won the National Award for Museum Service. Today, Carnegie Science Center is globally recognized for it's traveling exhibits and planetarium shows.	For over 55 years, COSI has focused on "all things science" through hands-on programs and inspiring interest in STEM. A central goal for COSI is community engagement, with the center reaching over one million people per year through onsite, offsite, and online experiences.	One of Exploratorium's goals is to influence educational policy throughout the United States. Programs have been designed with connection as the basis to bring together traditionally sperate worlds such as informal and formal education. Exploratorium sciences and educators are pioneers in making connections, working alongside researchers in the South Pole, to NASA scientists, to Tibetan monks to learn innovative ways to approach sciences.	Located on downtown Cleveland's waterfront, the Great Lakes Science Center is an educational facility and museum with exhibitions that focus on the natural environment in the Great Lakes region of the United States.	Chicago's Museum of Science and Industry if one of the largest and oldest institutions dedicated to the exploration and science and technological advancements in the United States. The Museum houses over 2,00 exhibits ranging from agricultural, transportation, technology, and communication. Hands-on participation and interactive education are promoted by the Museum.	The Museum of Science is a national leader in promotion engineering education while bringing science, technology, and mathematics to the forefront through its programs, exhibits, and events. The museum is one of the world's largest science centers and the most attended cultural institution in New England.	As part of the largest statewide science education programs in the United States, OMSI is a national and international leader in science education. The museum is dedicated to helping its community exchange ideas and foster experimentation through informed, smart choices and hands-on, high-quality learning experiences.	The Phillip and Patricia Frost Museum of Science seeks to spark wonder, investigation, and future innovation. Visitors are invited to explore the core sciences of the solar system, living systems, flight, human biology, and lights and lasers. The museum has a strong emphasis on hosting shows and interactive exhibits related to STEM subjects.			Arizona Science Center is the state's leader in providing STEM education programs, educator support, and interactive exhibits. The center is committed to providing lifelong learning and professional and personal development through public programs and internal initiatives for staff.	By combining exhibitions, the on-site Science Center School, a teacher development program, and Amgen Center for Science Learning, the California Science Center provides and innovative model for science learning.	Discovery Place is at the forefront of STEM education in the Carolinas. The museum is part of a network of four Discovery institutions across three cities that offer professional development programs for teachers and educational outreach programs for students from K-12. Discovery Place aims to support lifelong love of learning through motivating people to explore science, technology, and nature.	Pacific Science Center is a non-profit, independent science center with the mission to "ignite curiosity in every child and fuels a passion for discovery, experimentation, and critical thinking". The center believes that "Science is for everyone" and that critical thinking and curiosity are essential to equity and justice and that science has the power to connect people. The center is committed to providing access in all its facilities, programs, events, and exhibits.	Perot Museum of Nature and Science emphasizes hands-on adventure and discovery with a goal to inspire life-long learners. Visitors have the opportunity to explore topics and connections between human biology, robotics, natural environment, space and the universe, and dinosaurs. The museum houses several interactives including racing a T. rex, simulated earthquakes, and robot competitions.	The Franklin Institute is one of the country's leading science centers and is the most visited museum in the Commonwealth of Pennsylvania. The institute believes that science and technology have the potential to improve daily life and solve critical issues. As a central learning space and educational resource, over 1 million people are reached by the Institute annually through onsite visits and community outreach including classroom activities, workshops, and online programs.		
Recently Relocated/Revisioned	No	No	Yes - From 2005 to 2020, Science world was renamed the Telusphere (2005) and then the Telus World of Science (2005–2020) before returning to it's original name, Science World.	Relocated from downtown to suburban Nose Creek Valley in 2011	Yes - Currently undergoing the Aurora Project which will include: -an Arctic exhibition -a new Health Zone exhibition -an expanded guest amenities -a new community plaza -outdoor spaces			No	No	Yes - Moved to waterfront location in 2013. Space is available to possible expansion in the future.	No	Yes -Renaming announcement in 2019 to Kenneth C. Griffin Museum of Science and Industry	No					No	Phase II Expansion was completed in 2010. New permanent exhibition wing Ecosystems, featuring 11 immersive environments and over 400 live plant and animal species, was completed. Phase III includes the expansion of the Samuel Oschin Air and Space Center projected to open in 2022. Three new galleries with be added: Air Gallery, Space Gallery, and Shuttle Gallery.	In 2010, Discovery Place was completely transformed, with an 18-month, $31.6 million renovation, resulting in a re-imagined Museum with all-new interactive exhibitions and state-of-the-art labs that allowed the public to engage in real-world science problem solving.	No	No	No			
Key Spaces						Average	Median									Average	Median							Average	Median
Building Size of Centre/Museum (sq. ft.)	568,000	80,000	132,350	153,000	130,000	123,838	131,175	235,942	320,740	217,000	157,458	1,300,000	446,000	218,000	145,400	380,068	226,971	184,233	549,258	237,741	172,244	180,000	356,000	272,350	226,971
Exhibition Space (sq. ft.)	134,000	37,000	71,300	50,000	33,961	48,065	43,500	48,500	123,210	75,000	64,000	400,000	130,000	147,000	47,200	129,364	99,105	104,035	185,886	107,011	77,216	60,000	188,000	117,322	104,035
Exhibition Space as % of Building Space	24%	46%	54%	33%	26%	40%	39%	21%	38%	35%	41%	31%	29%	67%	32%	37%	39%	56%	34%	45%	45%	33%	53%	44%	45%
Outdoor Programming Space	Yes - Cahon Family Nature Escape	No	Yes - Ken Spencer Science Park and TD Environmental Trail	Yes - Brainasium (outdoor park and playground)	Yes - Located inside Coronation Park			Yes - USS Requin Submarine is exhibited outdoors on the Ohio River	Yes - Big Science Park and English Plaza which is used for COSI events and it rentable for private events	No	Yes - William G. Mather Steamship is docked near the center and tours are available	No	No	Yes - USS Blueback docked outside museum and available for tours	Yes - Outdoor terrace and science plaza used for museum hosted and private events			No	Yes - Roy A. Anderson Blackbird Exhibit & Garden						
General Admission (local currency) (2023)						Average	Median									Average	Median							Average	Median
Adult	$22.00	$27.00	$30.40	$26.00	$23.95	$26.84	$26.50	$25.00	$25.00	$39.95	$16.95	$21.95	$29.00	$16.00	$29.95	$25.48	$25.00	$21.95	Free	$23.00	$27.95	$25.00	$25.00	$24.65	$25.00
Senior	$16.00	$24.50	$24.30	$24.00	$21.95	$23.69	$24.15	$20.00	$23.00	$29.95	$16.95	$21.95	$25.00	$13.00	$29.95	$22.48	$25.00	$19.95	Free	$20.00	$25.95	$25.00	$25.00	$23.18	$25.00
Student	$16.00	$18.00	$24.30	$22.00	$21.95	$21.56	$21.98	$25.00	$25.00	$39.95	$16.95	$21.95	$29.00	$16.00	$29.95	$25.48	$22.48	$21.95	Free	$23.00	$27.95	$25.00	$25.00	$24.58	$24.00
Child	$13.00	$17.50	$20.30	$19.00	$18.95	$18.94	$18.98	$15.00	$20.00	$29.95	$13.95	$12.95	$24.00	$11.00	$22.95	$18.73	$25.00	$15.95	Free	$18.00	$19.95	$15.00	$21.00	$17.98	$18.98
Attendance (2019/2020)						Average	Median									Average	Median							Average	Median
On-Site Attendance	885,000	617,850	920,663	431,280	452,782	605,644	535,316	579,035	761,130	833,868	310,000	1,400,000	1,372,240	670,991	728,738	832,000	744,934	514,363	2,201,306	727,972	861,347	950,396	900,000	1,025,897	880,674
Visitors per Sq. Ft. Exhibition Space	6.60	16.70	12.91	8.63	13.33	12.89	13.12	11.94	6.18	11.12	4.84	3.50	10.56	4.56	15.44	8.52	8.37	4.94	11.84	6.80	11.16	15.84	4.79	9.23	8.98
Visitors per 1,000 CMA Population	149.3	150.7	373.7	309.7	342.6	294.2	326.2	249.1	361.3	176.3	150.7	148.0	281.5	270.7	117.6	204.4	209.3	105.88	165.62	283.34	218.65	126.04	147.63	174.5	156.6
Off-Site Attendance	N/A	1,056	125,461	50,000	29,902	51,605	39,951	165,210	291,530	N/A	N/A	N/A	100,182	138,425	11,500	83,369	100,182	83,457	N/A	42,019	123,912	196,433	N/A	111,455	103,685
School Groups																									
Students Served On-Site	170,000	137,915	60,501	80,000	74,952	88,342	77,476	55,380	57,400	125,607	N/A	35,800	132,906	83,179	95,824	86,927	89,502	83,745	375,000	90,195	42,375	140,948	200,000	155,377	115,572
On-Site Students as % of Total Attendance	19.2%	22.3%	6.6%	18.5%	16.6%	16.0%	17.6%	9.6%	7.5%	15.1%	N/A	2.6%	9.7%	12.4%	13.1%	9.4%	11.0%	16.3%	17.0%	12.4%	4.9%	14.8%	22.2%	14.6%	15.6%
Students Served Off-Site	N/A	1,056	125,461	N/A	29,902	52,140	29,902	N/A	291,530	N/A	N/A	N/A	86,326	93,367	250	59,981	86,326	64,408	N/A	42,019	124,364	94,867	N/A	81,415	79,638
ASTC (2019/2020) Financials or Annual Report						Average	Median									Average	Median							Average	Median
Operating Revenue	**$37,779,000**	**$8,952,875**	**$14,341,922**	**$12,039,154**	**$8,511,772**	**$10,961,431**	**$10,496,015**	**$17,392,081**	**$17,904,704**	**$46,596,649**	**$6,203,488**	**$95,418,772**	**$58,086,000**	**$21,896,950**	**$19,141,718**	**$35,330,045**	**$20,519,334**	**$16,383,425**	**$44,475,005**	**$21,435,349**	**$25,281,529**	**$28,032,588**	**$38,397,472**	**$29,000,895**	**$26,657,059**
Earned Income	32.8%	47.2%	85.6%	73.4%	79.9%	71.5%	76.7%	58.0%	74.1%	54.5%	54.1%	31.9%	66.5%	69.7%	72.5%	60.2%	62.3%	42.2%	38.3%	42.5%	77.7%	65.4%	59.7%	54.3%	51.1%
Public Funds	53.7%	43.9%	4.4%	26.1%	18.9%	23.3%	22.5%	4.9%	7.0%	7.3%	13.5%	6.3%	6.8%	9.3%	4.8%	7.5%	6.9%	1.8%	48.2%	5.1%	6.9%	2.8%	0.1%	10.8%	4.0%
Private/Other Funds	13.5%	8.9%	10.0%	0.5%	1.2%	5.2%	5.1%	37.1%	18.9%	38.2%	32.4%	61.8%	26.7%	21.0%	22.7%	32.4%	29.6%	56.0%	13.5%	52.4%	15.4%	29.4%	41.2%	34.7%	35.3%
Operating Expenses	**$36,061,000**	**$13,762,270**	**$12,675,432**	**$12,031,024**	**$8,278,259**	**$11,686,746**	**$12,353,228**	**$17,392,081**	**$17,527,542**	**$46,383,280**	**$6,393,065**	**$53,636,621**	**$60,241,000**	**$18,683,603**	**$20,526,858**	**$30,098,006**	**$19,605,231**	**$12,380,007**	**$39,518,286**	**$12,704,111**	**$25,960,684**	**$22,139,399**	**$34,966,247**	**$24,611,456**	**$24,050,042**
Program, Exhibits, & Events																									
Public Programs/Education	●Live Demonstrations (The Energy Show, Papermaking Demonstratio ns, A Hair-raising Experience, Engage with our Hosts!) ●Planetarium Shows ●IMAX Dome Films (Back From the Brink, Oceans: Our Blue Planet, Superpower Dogs, Volcanoes: The Fires of Creation) ●Teacher Programs ●Teacher Resources (STEM Education Toolkit, Curriculum Resources, Professional Learning Resources) ●Science at Home ●Science School	●Subject Yourself (visitors can become research subjects) ●5 Primary Programs: -Planet of the Senses -Rock 'n' Roll Marbles -Shh! It's Story Time -M-organ's Journey -Mysterious Machines -SOS Radio ●3 Secondary Programs: -The Great Debaters: Human -Shock Wave -Tech Up ● Child Daycare ●Week and Day Camps	●Girls and STEAM ●Preschool Curiosity Club ●Summer Camps ●Tech-Up (for students and professional development for teachers) ●Robotics Club ●Future Science Leaders ●Community Pass Program	●Spark Science from Home ●Extensive Educational Programming including workshops and Dome Theatre shows available by level: -Students K-3 -Grades 4-6 -Grades 7-12 ●Chevron Open Minds (Weeklong program available for school groups) ●Direct from the Operating Room (students can watch surgeries live in-person or online) ●Live Science Shows	●Astronomy Classes ●Virtual School Programs/Outreach Programs: -One 30-45 minute program -A series of 30-45 min Virtual Programs -Pre-Recorded Tutorials -Edmonton Outreach Programs (In- School Program) -Traveling Nature Exchange (In-School Program)			●School Field Trips for students K-12 ●Teaching Excellence Academy ●Bring Science To You (Outreach program) ●Student Competitions ●Buhl Planetarium programs ●The Rangos Giant Cinema films	●COSI's Interactive Videoconference programs (two way online workshops for schools with science professionals) ●COSI on Wheels (outreach program) ●COSI Lab Spaces (hands-on learning)	●Science Snack (activities for at home or school) ● The Tinkering Studio ●Tinkering at Home (activates designed for home) ● Teacher Institute (professional development) ●Institute for Inquiry Institute for Inquiry: Examining the Art of Science Education(Professional development for teachers)	●Field Trips ●Hands-on Workshops ●Great Science Academy (held twice a month) ●Learning Lab (education at home) ●Early Childhood Workshops ●Home School Workshops	●Fieldtrips include one or more of the following: -Exhibits -Learning Labs -Films -Ir. Science Cafes -Tours and experiences -Museum exploration guides ●Dream It, Design It, Fab It! (manufacturing design, technology and engineering)	●Summer Courses ●High School Science Series ●Field Trips ●Educator Resource Center ●Professional development (for teachers) ●Traveling Programs (outreach for schools) ●Engineering education programs based on grade: -Eit for Kindergarten -Engineering is Elementary -Engineering Adventures -Engineering Everywhere	●Summer Camps & Classes ●Education Programs are separated by the following grade levels: -K – 1st Grade -2 – 3rd Grade -4th – 5th Grade -6th – 8th Grade ●Outreach Education	●Guided Tours ●Field Trips ●Mini-Me Science ●Frost Science Museum Pods (onsite education while schools reopen post COVID, grades k-5) ●Citizen Science ●Internships at Frost Science (teens) ** Several programs and activities now offered virtually	●Field Trips to Center and/or CREATE makerspace ●School Outreach Programs including Rural Communities Expansion Project (focuses on outreach programming for rural schools) ●Girls in STEM ●Educator Events (ex. STEM-Club Training and workshops) ●Professional Development Program (ex. Educator Boot Camps, Mentoring and Coaching, and Consulting Services) ●Science Teacher Residency (STAR) Program	●Travelling Science Lab ●Youth Curators: connecting youth to STEM opportunities in California ●Community Teens: paid internships for students in grades 10-12 ●Professional Development: partnerships with teachers and school districts ●Big Lab Fieldtrips ●Homeschool Programs	●School Camps ●Field Trips ●Girls in STEM ●Scout Programs ●Homeschool Classes ●Summer Camps ●Outreach Classes ●Stay-at-Home Science	●Tinker Tank ●Artist in Residence ●Startup In Residence	●Early Childhood Classes ●TECH trucks (outreach program) ●A Day In The Life (immersive experience with professionals) ●Homeschool Family Science Days	●Professional Development (research based) ●Master Educator Program (teachers and administrators) ●GSK Science in the Summer ●Be a Chemist at Home This Summer! ●PACTS (year round science program) ●STEM Scholars		

		Larger City Canadian Science Centres						US Waterfront Science Centres									US Downtown Science Centres							
Name	Ontario Science Centre	Montreal Science Centre	Science World	TELUS Spark	Telus World of Science	Average	Median	Carnegie Science Center	COSI - Center of Science and Industry	Exploratorium	Great Lakes Science Center	Museum of Science and Industry, Chicago	Museum of Science	Oregon Museum of Science and Industry	Phillip/Patricia Frost Museum of Science	Average	Median	Arizona Science Center	California Science Center	Discovery Place Science	Pacific Science Center	Perot Museum of Nature and Science	The Franklin Institute	Average	Median
Events/Activities		●Science Day Camps ●March Break Camps ●Summer Camps ●Sleepovers ●Team Building: -Challenger Learning Centre (Group Size:16-32 participants, Duration: 3 hours, Cost: $2,500) -The Challenge Zone (Group Size: 5-50 participants, Duration: 90 minutes, Cost: $2,000 plus $25 per person) -Scavenger Hunts Cost: $18 per person, plus room rental, Optional Cost: $200 for Host-Facilitator)	●Seasonally-based activities ●On the Road (Outreach science events) ●Community Science Celebration (Community showcase) ●BC Green Games (eco-storytelling contest) ●Big Science for Little Hand (activities and workshops) ●Science World Extravagant Evenings for Teens ●Science of Cocktails ●Uncorked	●Camps ●Sleepovers ●Drive-In Movies ●Spark Science Road Trips (Self-directed, curated maps provided by centre) ●Fever Fridays (18+) ●Science Communications (workshops)	●Build Your New Science Centre ●LUMEN Kitchen Party (fundraising event) ●Science at Home ●#MakerMonday (at home activities)			●Live Shows: -Science Stage -BodyStage -Works Theater ●Built Planetarium Laser Shows ●For Children: -Summer Camps -Preschool Programs -Sleepovers -Workshops -Competitions -Scouts -Birthday Parties ●For Adults: -Science After Hours -Cafe Sci -Two Scientists -Science on the Road -Workshops -Requin Tech Tours -Carnegie Science Award	●COSI camps ●Live experiments and demonstrations ●Planetarium shows ●Giant Screen Theatre shows ●COSI Lab Spaces (hands-on learning)	Events and activities have moved online as Exploratorium is closed to the public. Online events and activities include: ●After Dark Online (18+): discussions on relevant topics such as Wildfires, Mediated Messaging ●Full Spectrum Shorts ●Storytime Science for Kids ●Learning Toolbox	●Cleveland Clinic DOME Theater shows ●Spring Break Camps ●Summer Day Camps ●Winter Break Camps ●Design & Build (Design challenges) ●Daily Science Demos ●Curiosity Open (Robotics Challenge) ●Great Science Gala ●Liftoff! (Gala afterparty)	●Giant Dome Theatre shows ●Live Science Experiences ●VR Transporter (transports visitors into outer space) ●Flight and Motion Simulators	●Omni Theatre shows ●Planetarium Shows ●4-D Films ●Live Presentations ●Book Club for the Curious ●Women and Girls in STEM Month ●NanoDays with a Quantum Leap 2020	●Empirical Theater Shows: -Daytime Documentaries -Hollywood Blockbusters -Sci-Fi Film Fest -Theater Events ●Kendall Concerts ●Reel Science (movie nights) ●Maker Workshops ●Star Parties ●Reel Eats ●Science Pub ●Meet a Scientist	●Team Building Activities ●Animal Encounters ●Guest Speakers ●Laser Shows ●Stargazing ●Camps ●Overnight Adventures			●CREATE at Arizona Science Center - events that take place in the center's 6,600 sq. ft. makerspace ●Frys Free Weekend ●Lasers and Liquor (adults) ●Science with a Twist (adults) ●Snow Week ●Weird Science Halloween	●Live Shows & Demonstrations ●Scout Days ●Science Saturdays ●California Science and Engineering Fair ●Annual Discovery Ball Benefit	●Labs ●Live Shows	●Curiosity Expo ●Meet A Scientist ●Science in the City (lectures) ●Game Jam ●Railroad Show ●IMAX Movies ●PacSci at Night (21+) ●Playdates at Pacsci ●Play Lab ●Parents' Night Out ●Family Science Night ●Girls' Night Out ●Camps	●Architecture tours of the museum building ●Art Lab ●Discovery Camp ●Sleepovers ●Scouting Adventures ●Social Science (21+) ●National Geographic Live (speaker series)	●Daily Live Science Demonstrations ●Take Flight Simulator ●Night Skies in The Observatory ●Community Nights ●Sensory Friendly Every Day ●Science After Hours ●Kitchen Science ●Science After Hours		
Digital/Virtual	●Facebook Live Events	● Links to Online Games/Activities: -Interactive File on Criminalistics -Coronaventures -Morbus Delirium	●Code Along Online Classes ●Educator and Parent resources are offered online	●DIY Science Centre (Online paid programming for students) ●Live from Spark (on YouTube): Guided live talks from remarkable creators, scientists, artists, educators and builders. ●Direct from the Operating Room (students can watch surgeries live in-person or online)	●Online Zeidler Dome Shows -Online Nature ●Exchange - online gallery and program ●COVID-19 Science (Interviews with experts) ●Science at Al's House (Demonstration done by the President & CEO) ●Virtual School Programs ●Science Moments (pre-recorded demonstrations)			●Online Educator Resources	●COSI Connects: -Virtual Exhibits -360 tour -online activities ●COSI's Interactive Videoconference programs (two way online workshops for schools with science professionals)	●After Dark Online (18+): discussions on relevant topics such as Wildfires, Mediated Messaging ●Full Spectrum Shorts ●Storytime Science for Kids ●Learning Toolbox ●Created/partnered on several mobile apps including: -Total Solar Eclipse -Sound Uncovered -Color Uncovered -Sound Rebound -How Many Saturdays? -Science Journal	●NASA Glenn Visitor Center App	●Tuesday Tales ●Online Films	●#MOSatHome: -Digital Live Stream -STEM Beyond School ●Overnights at the Museum ●Ask a virtual expert	●Virtual OMSI After Dark Brewfest	●Virtual Birthday Parties ●Virtual Homeschool ●Virtual Field Trips ●Virtual Outreach ●Virtual Mini-Camps			●Online platform "Connect" offers virtual learning including lesson plans, interactive videos, activities, and articles for parents, students, and educators. ●Each day at 12:30pm, the center hosts Facebook Live activities and demonstrations. ●Virtual Learning Support is offered by the center's learning team through the Science Hall during the virtual school day.	●Stuck at Home Science for Youth ●Virtual Hands-On Science Camp	●Virtual Classes: -All that Matters -Animal Ecology -Animal Lifecycles -Animals in their Environment -Body Systems -Earth Explorers -Forces and Motion	●Virtual Field Trips ●Curiosity Course ●Curiosity at Home ●PacSci Streaming Videos	●Science Spotlight: COVID-19 online speaker series	●Franklin Instameets (Instagram) ●#SparkofScience (short instructional videos)		
Perm Exhibitions	●KidSpark (Human Biology, Natural Environment, Physics + Engineering, Weather + Climate, Psychology + Perceptions) ●Space Hall (Physics + Engineering, Space + Exploration) ●A Question of Truth (Psychology + Perceptions) ●The AstraZeneca Human Edge (Human Biology) ●Cohon Family Nature Escape (Natural Environment) ●The HotZone (All categories) ●The Living Earth (Natural Environment) ●Science Arcade (Physics + Engineering) ● Weston Family Innovation Centre (Physics + Engineering, Psychology + Perceptions) ● Forest Lane (Natural Environment)	●Fabrik - Creativity Factory (Technology, Engineering) ●Explore - Life-Sized Science (Engineering, Energy) ●Human (Biology) ●Clic! The Zone for Curious Young Minds (Engineering) ●Water in the Universe (Space, Natural Environment) ●The Windmills of the Imagination (Natural Environment, Energy)	●Art Displays (Features local artists) ●Birdly (Flight) ●BodyWorks (Biology) ●Eureka! (Energy) ●Ken Spencer Science Park (Natural Environment) ●Living Lab (Psychology) ●Puzzles and Illusions (Brain, Psychology) ●Search: Sara Stern Gallery (Natural Environment) ●Tinkering Space: The WorkSafeBC Gallery (Makerspace) ●TD Environmental Trail (transportation, food, water, and waste) ●Wonder Gallery (play, tactile experience)	●Creative Kids Museum ●Brainasium (Outdoors) ●Energy & Innovation ●Earth and Sky ●Open Studio (Makerspace) ●Being Human	●The Future of TELUS World of Science - Edmonton ●The Nature Exchange (Natural Environment) ●S.P.A.C.E. Gallery ●CuriousCITY (dedicated gallery for children under 8, various scientific topics) ●The Science Garage (Engineering)			●Bricksburgh (Engineering, Art, Architecture) ●Ropes Challenge (Gravity, physiology) ●BodyWorks (Biology) ●H2Ohl (Water, Natural Resources) ●USS Requin Submarine (Underwater Tech) ●Highmark SportsWorks (Physics, Biology) ●roboworld (robotics) ●Miniature Railroad & Village (history, engineering) ●NETL Energy Zone (Energy, electricity) ●Little Learner Clubhouse (Various topics, interactives) ●SpacePlace (Space)	●Big Science Park (Natural Environment, Biology) ●American Museum of Natural History Dinosaur Gallery ●Little kidspace (various topics; medical, biology, biology) ●Space ●Ocean ●Life ●Energy Explorers ●Hallway Exhibitions (photography) ●Process (change, inventions, technology) ●Gadgets (motions, mechanics, human brain) ●WOSU@COSI (digital media)	●Exploratorium has dozen of exhibits that cover the following subjects: ●Astronomy & Space Sciences ●Biology ●Chemistry ●Data ●Earth Science ●Engineering & Technology ●Environmental Science ●History ●Mathematics ●Nature of Science ●Perception ●Physics ●Social Science	●NASA Glenn Visitor Center ●Cleveland Creates Zone (makerspace) ●William G. Mather Steamship ●NANO Mini Exhibit ●Solarworks ●Windturbine ●Windworks ●Augmented Reality Sandboxes ●RioMedTech ●Science Phenomena (energy, electricity, engineering) ●Youth Exhibits ●TapeScape-Recycled Science	●U-505 Submarine ●Wonder Is All Natural (Nature) ●YOU! The Experience (biology, personality, environment) ●Colleen Moore's Fairy Castle (Pop culture) ●Extreme Ice (Climate change) ●The Idea Factory (construction, simple machines, light, magnetism) ●Coal Mine ●Yesterday's Main Street (history) ●Whispering Gallery (acoustic design) ●ToyMaker 3000: An Adventure in Automation ●Swiss Jolly Ball (Mechanics) ●Earth Revealed ●The Art of the Bicycle (engineering and tech) ●Henry Crown Space Center (Space) ●Fast Forward… Inventing the Future ●Farm Tech ●Transportation Gallery	●Hall of Human Life Permanent Exhibit ●Wicked Smart: Invented in the Hub ●Colossal Fossil: Triceratops Cliff	●Space Science Hall ●Science Playground (discovery lab) ●Empirical Hall ●Natural Sciences Hall ●Submarine - USS Blueback	●Power of Science (oceans, biology, universe, technology) ●Feathers to the Stars (animal flights, human flight, space exploration) ●MeLaβ (mind and body) ●River of Grass (ecosystems, natural environment)			●All About Me (Biology) ●Flight Zone ●Making Sense of Your Dollars and Cents (Financial Literacy) ●The W.O.N.D.E.R. Center (Neurological Education) ●Evans Family SkyCycle Page (Physics) ●Get Charged Up (Electricity) ●Forces of Nature (Earth) ●My Digital World (Current and Past Technology) ●Solarville (Renewable Energy)	●Ecosystems ●Creative World (Structures, Transportation) ●World of Life (Biology, Energy, Supply/Demand) ●Air & Space ●Roy A. Anderson Blackbird Exhibit & Garden (Outdoor Environments)	●World Alive (biodiversity, ecosystems) ●KidScience (early education exhibition) ●Cool Stuff (technology, electricity) ●Project Build (engineering, architecture) ●Think It Up (hands-on, electricity, music) ●Being Me (biology)	●We Are Data ●Tropical Butterfly House ●Wellbody Academy (health, wellbeing) ●Living Exhibits ●Body Works ●Just for Tots ●Civilized Seeds: A History of People and Plants ●Puget Sound Model ●Dinosaurs: A Journey Through Time	●Moody Family Children's Museum ●Lamar Hunt Family Sports Hall ●Being Human Hall (biology) ●Texas Instruments Engineering and Innovation Hall (Engineering) ●Discovering Life Hall (Animals) ●Tom Hunt Energy Hall ●Lyda Hill Gems and Minerals Hall ●The Rees-Jones Foundation Dynamic Earth Hall (weather) ●T. Boone Pickens Life Then and Now Hall (Dinosaurs) ●Expanding Universe Hall (Space) ●Rose Hall Of Birds	●The Giant Heart ●Your Brain ●The Train Factory ●Sir Isaac's Loft (physics) ●Space Command ●Amazing Machine ●Changing Earth ●Electricity ●Tech Studio ●The Holt & Miller Observatory ●The Franklin Air Show ●SportsZone		

		Larger City Canadian Science Centres						US Waterfront Science Centres									US Downtown Science Centres							
Name	Ontario Science Centre	Montreal Science Centre	Science World	TELUS Spark	Telus World of Science	Average	Median	Carnegie Science Center	COSI - Center of Science and Industry	Exploratorium	Great Lakes Science Center	Museum of Science and Industry, Chicago	Museum of Science	Oregon Museum of Science and Industry	Phillip/Patricia Frost Museum of Science	Average	Median	Arizona Science Center	California Science Center	Discovery Place Science	Pacific Science Center	Perot Museum of Nature and Science	The Franklin Institute	Average	Median
Temporary/Feature Exhibitions	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes		
Special Features	●IMAX Dome Films ●The Planetarium ●Outdoor Programming - Cohon Family Nature Escape	●IMAX TELUS Theatre ●Heavy focus on gaming	●OMNIMAX Theatre ●Outdoor Programming: -Ken Spencer Science Park -TD Environmental Trail	●DomeTheatre ● Outdoor Programming Space: Brainasium (outdoor park and playground)	●IMAX Theatre ●Zeidler Dome ● Gallery dedicated to future expansion project, welcomes public opinion ● Located inside Coronation Park			●Buhl Planetarium ●Duquesne Light Co. STEM Center ●Fab Lab (digital fabrication laboratory) ●The Rangos Giant Cinema ●USS Requin Submarine	●The Planetarium ●Giant Screen Theatre	●Artworks on View throughout the center ●Black Box multimedia art installation room ●Created/partnered on several mobile apps including: -Total Solar Eclipse -Sound Uncovered -Color Uncovered -Sound Rebound -How Many Saturdays? -Science Journal ●Digital Teaching Boxes	●MC2 STEM High School (located on site, Cleveland Metropolitan School District (CMSD) and the Science Center. Focusing on STEM education) ●Cleveland Clinic DOME Theater ●NASA Glenn Visitor Center	●Temp Exhibit focusing on DEIA Black Creativity: 50 Years ●Giant Dome Theatre	●Omni Theatre ●Planetarium ●4-D Films Theatre ●Butterfly Garden -- Garden Walk & Insect Zoo ●Thrill Ride 360° ●SubSpace After Dark Live! (adult program)	●USS Blueback ●Empirical Theater ●Kendall Planetarium	●Frost Planetarium ●Aquarium			●Irene P. Flinn Giant Screen Theater ●Dorrance Planetarium	●IMAX Theater with Laser ●188,000 gallon Aquarium	●Discovery Theater ●IMAX Dome Theatre	●Laser Dome ●IMAX Movies	●The Hoglund Foundation Theater ● ●	●Tuttleman IMAX Theater ●Fels Planetarium ●Benjamin Franklin National Memorial		
Rental Program	●Birthday Parties ●Private Events: -Meeting -Trade show -Product launch -Awards ceremony -Performance -Networking event -Gala dinner -Wedding -Bar/bat mitzvah -Film shoot	●Children's Birthday Parties. Three packages: -Two-hour exhibition package (total duration of 3 ½ hours on site at the Science Centre) -IMAX film package (total of 2 ½ hours on site) -Exhibition & IMAX combo package (total of 4 ½ hours on site)	Rentals available for 20 to 1,800 people ●Nano Nuptials ●Birthday Parties ●Camp In Spaces are available for rent from $1,800 to $6,500 Rental Package: https://www.scienceworld .ca/wp-content/uploads/fr ntlo- package_20200610.pdf	Available for a variety of events with full catering. Spaces include: ●Atrium ●Dome Lobby ●Dome Theatre ●Perm/Feature Gallery ●Inspiration Stage ●Social Eatery ●Brainasium ●Outdoor Park ● Learning Centre	Following areas are available: ●IMAX Theatre ●Zeidler Dome ●Science Stage ●Boardroom ●Winspear Learning Centre ●Park View Room ●Syncrude Environment Gallery ● The Body Fantastic in the Allard Family Gallery ● The Science Garage in the Hole Family Gallery ●S.P.A.C.E. Gallery ●Purple Pear restaurant			●The following spaces are available for private event rentals: -PointView Hall -Science Stage -Covestro Gallery – H2Oh!: Why Our Rivers Matter Exhibit Area -Buhl Planetarium and 2nd Floor Exhibit Areas -BodyWorks 3rd Floor Exhibit Areas and BodyStage -Works Theater and 4th Floor Exhibits -Wean Family Overlook Room -Highmark SportsWorks -Full Building	●Private event rentals are available in the following spaces: -Gallery II -Atrium -English Plaza -Southpoint	●Private event rentals are available in the following spaces: -Full Facility & Gallery Bundles -Fisher Bay Observatory Gallery & Terrace -East Gallery -Bechtel Central Gallery -Osher West Gallery -Kanbar Forum	●Day and evening rentals are available for groups of 10 to 1,000.	●Private event rentals are available in the following spaces: - Entire Museum -Rotunda -U-505 Submarine -South Portico -Entry Hall -North Portico -Smart Home -West Pavilion -Rosenwald Room -Auditorium -Henry Crown Space Center -Giant Dome Theater -Little Theater	●Yes, rentable for weddings, birthdays, and work events	●Private event rentals are available in the following spaces: - Waterfront restaurant - Four exhibit halls - Empirical Theater - Kendall Planetarium ●Featured packages include: -Company Picnic Package -Evening Event Package -Meeting Planner Package	●Private event rentals are available in the following spaces: - Aquarium - Ocean Gallery - Planetarium - Knight Learning Center -Rooftop Terrace & Observation Deck -Science Plaza			Yes - Rentals are available including in exhibition halls and planetarium.	Can host events from 40 to 4,000 people. Rental spaces include: ●Samuel Oschin Space Shuttle Endeavour Pavilion ●Wallis Annenberg Building: Big Lab ●J. Howard Edgerton Court ●The Walt Disney Company Foundation Science Court ●Ecosystems ●Robert H. Lorsch Family Pavilion ●IMAX with Laser Theater ●Donald P. Loker Conference Center ●Irteszek Family Foundation MUSES Room ●Howard F. Ahmanson Building North Patios	●Private events are available in the following locations: -Level 1 -Level 2 -Level 3 -Full Museum -Windows on Tryon -Sun Terrace -Discovery Theater -IMAX Dome Theatre -Education Studio	●Private events are available in the following locations: -Ackerley Family Exhibit Gallery -Board Room & Small Conference Room -IMAX Theaters -Laser Dome Theater -Building 1 -Building 2 -Building 3 -Building 4	●Private events are available in the following locations: -Jan and Trevor Rees- Jones Exhibition Hall -Lamar Hunt Family -Sports Hall -Moody Family -Children's Museum -Learning Labs -Musical staircase -Outdoor Plaza -Main entrance -Glass-encased Main -Lobby -The Hoglund Foundation Theater -David's Deck: an outdoor observation space -Discovering Life Hall -Being Human Hall -Texas Instruments -Engineering and Innovation Hall -The Rees-Jones Foundation Dynamic Earth Hall -Lyda Hill Gems and	●Private events are available in the following locations: -Benjamin Franklin Memorial Hall -Jordan Lobby -Conference centre -Fels Planetarium -Space Command & NOW/NEXT -The Train Factory -Pepper Hall and Patent Library -Giant Heart -Changing Earth -Electricity -Wisdom Hall & Your Brain -Rooftop Deck -Theaters and Presentation Spaces		

Environmental Scan – International

Confidential and Privileged Advice to Government

International Science Centres	Europe										
Name	**Glasgow Science Centre**	**City of Science and Industry**	**Experimentarium**	**NEMO Science Museum**	**Phaeno Science Center**	**Universum-Bremen**	**Ciudad de las Artes y las Ciencias**	**Copernicus Science Center**	**Pavilhão do Conhecimento**	**Deutsches Museum (Munich Science Centre)**	**ArtScience Museum**
											
Location	Glasgow SCT,UK	Paris, FR	Copenhagen, DK	Amsterdam, NL	Wolfsburg, DE	Bremen, DE	Valencia, ES	Warsaw, PL	Lisbon, PT	Munich, DE	Singapore
Region Served	Glasgow City Region	Ile-de-France	Region Hovedstaden	Western Netherlands	Hannover–Braunschweig–Göttingen–Wolfsburg Metropolitan Region	Bremen City	Valencian Community	Warsaw Greater Metro Area	Lisbon Metro Area	Munich Metro Area	Central Region
Regional Population	1,800,000	12,210,000	1,836,000	8,252,000	3,900,000	547,976	4,975,000	3,100,000	2,827,514	6,000,000	922,980
Location within City	Waterfront	Suburban; surrounded by man-made water feature	Waterfront - Suburban	Waterfront	Downtown	Downtown	Downtown Adjacent	Waterfront	Suburban	Downtown	Downtown Waterfront
General Institution Info											
Founded	2001	1986	1991	1923	2005	2000	1998 (full complex) 2000 (Science Museum)	2005	1998	1903	2011
Mission	We want to inspire everyone to explore and understand the world around them and to discover and enjoy science.	A place for sharing and meeting, the City of Science and Industry strives to make accessible to everyone, whatever their background, the discovery of sciences, techniques, industrial know-how and its challenges .	To stimulate people's interest in science and technology and to increase their awareness of methods and results within science and technology.	To bring science and technology closer to the public in an interactive and accessible way, in the museum, at schools, at nationwide events and online.	Philosophy: Let your curiosity run free and go on an adventure journey through the world of phenomena in an environment that has been specially created for this.	Awaken curiosity, seduce astonishment, arouse enthusiasm and provoke questions	The City of Arts and Sciences in Valencia is a unique complex devoted to scientific and cultural dissemination.	We inspire to experience, understand the world and act responsibly.	To promote active citizenship based on scientific knowledge.	For over 100 years, Deutsches Museum has presented exhibitions on scientific and technological advancements while also reflecting on social change. Exhibitions cover topics including of materials, energy, communication, transportation, natural science, musical instruments, and new technology.	To explore where art, science, culture and technology come together
General Description	Glasgow Science Centre is a registered charity with the goal to encourage, motivate, and inspire people of all ages, abilities, and social backgrounds to engage in science. The centre aims to help individuals develop skills and confidence to participate in a society where technology and science are prevalent.	City of Science and Industry is located in the centre of the multicultural park La Villette in Paris, France. The science centre is a place of Universecience, bridging science, technology, and society.	Experimentarium is a science centre with high quality hands-on exhibitions and stresses play to help visitors experience science in innovative ways. The centre has programs for families, schools, and science lovers of all ages	At NEMO Science Museum visitors connect with science and technology through a hands-on, informal learning environment. NEMO presents technology and scientific phenomena that plan an important role in the daily life of visitors. The museum also houses a significant historical collection.	Phaeno Science Centre explores the connections between art and science to incite questions that lead to new discoveries and thoughts. The centre stresses the experience of the individual; individuals have the ability to generate their own unique questions and answers.	The Universum Bremen emphasizes scientific phenomena discovery and research through interactive and hands-on exhibits, visitor inquiry, and play. The centre aims to encourage visitors of all ages to engage in science through enthusiasm, amazement, and understanding.	The main objective of the Science Museum is to stimulate critical thinking and curiosity in the realms of science, technology, and the environment. The museum prioritizes interactivity leading with the motto "Forbidden not to touch, not to feel, not to think".	Copernicus Science Centre is home to over 450 interactive exhibits. The centre focuses on hands-on experiences to help visitors engage in self directed learning. The centre carries the reputation as one of the most advanced science centres in Europe.	The Pavilhão do Conhecimento is a science museum that aims to provide access of the science and technology to everyone. The museum houses hundreds of exhibits in the subjects of mathematics, physics, biology, chemistry, and social sciences.	We present science and technology as something to be seen and experienced and illustrate its cultural significance by exhibiting unique masterpieces. We inspire people to play an active role in shaping the future.	ArtScience Museum in Singapore presented the intersection of arts and science through large-scale exhibits. The museum has only one permanent exhibition and mostly features digital and multimedia exhibits curated by other institutions.
History	Glasgow Science Centre opened to the public in June 2001. The centre was part of the Pacific Quay redevelopment project which converted the old cargo port into a cultural destination commencing with the Glasgow Garden Festival in 1988. In 2007, the headquarters for BBC Scotland and Scottish Television opened at the Quay. Glasgow Science Centre was designed by the Building Design Partnership and cost around £75 million with £37 million in public funds from the Millennium Commission. To commemorate the Clydesdale Bank Tower which was dismantled and relocated off-site, the new science centre incorporated a £10 million for the Glasgow Tower which provides visitors with panoramic views of the city and beyond.	City of Science is was part of the revitalization project of the La Villette site, a former slaughterhouse site that ceased operations in 1974 and was converted into a multicultural park in the 1980s. The centre opened in 1986 and was designed by architect Adrien Fansilber in collaboration with engineer Gérard Chamayou. In 1992, the centre opened a dedicated children's gallery the Cité des enfants. In 2007, the "New Generation" Children's City for children aged 2-7 opened, and in 2009 a Cité des enfants was upgraded for children aged 5-12. City of Science is a location of discovery, education, and innovation built for a diverse audience.	Located in Hellerup, north of Copenhagen, Experimentarium is a science centre that opened in 1991. The facility is a former bottle plant that was operated by the Tuborg beer company. From 2014 to 2016, Experimentarium moved temporarily to a downtown location while a renovation and expansion project was completed. In 2017, the centre opened after a renovation and expansion project by CEBRA. Today, the centre focuses on exploration of science and technology with the goal of "bringing out the scientist in us all" and encourages visitors to ask questions and question answers to those questions.	Throughout its 100-year history, NEMO Science Centre has been at the forefront of scientific and technological progress including industrialization, sustainability, and innovation. The museum was founded as the Labour Museum by industrial painter Herman Heijenbrock who wanted a location to display his collections of paintings and objects. Between 1945-1970, the museum was rebranded as the Netherlands Institute for Industry and Technology (NINT) with exhibitions aimed as getting youth excited about careers in technology and innovation. In the 1970's and 1980's the museum adopted the American approach of "play" and began covering topics aligned with school curriculum such as physics, chemistry, engineering, and computers. In 1997, the museum was relocated to its current location in Amsterdam's eastern docklands and in 2000, was renamed NEMO Science Centre.	Phaeno Science Centre was conceptualized by City of Wolfsburg staff in 1998 with the desire to build a cultural attraction near Wolfsburg's rail station to compliment the existing Kunst Museum (art museum). After four years of construction, the centre opened in November 2005. The building was designed by star architect Zaha Hadid and incorporated innovative architectural elements such as self compacting concrete and specially developed glass facades. Phaeno Science Centre has won several awards for its unique architectural design.	Universum® Bremen opened on September 9, 2000 after a year and a half of construction. In 2007, the centre was expanded to include a new temporary exhibition building and an outdoor interactive area. In 2015, the centre reopened after an extensive renovation project with a completely updated visitor experience and new interactive and multimedia exhibitions that focus on three subject areas; technology, people, and nature. The centre is recognizable for its 'whale' shaped exterior.	The City of Arts and Sciences first opened in 1998 with the construction of the complex's fist building the Hemisféric (theatre building). Two years later, the Science Museum and Umbracle (indoor garden) opened followed by the Oceanográfic (Aquarium) in 2003. The Palau de les Arts Reina Sofía was constructed in 2005 and in 2009, the site's final addition, the Ágora (events building) was completed. The Science Museum was designed by star architect Santiago Calatrava is known for its 21st-century interactives that provide visitors with entertaining ways to explore life, science, and technology. Today, the City of Arts and Sciences is a unique complex with the aim of scientific and cultural dissemination and welcomes approximately 4 million visitors annually.	Located on the bank of the Vistula River in Warsaw, Poland, Copernicus Science Centre was established in 2005 and opened to the public in 2010. Since 2011, the centre has undergone building upgrades including the addition of a Robotic Theatre, chemistry lab, biology lab, robotic workshop, and physics lab. The centre encourages visitors to experiment, experience, and explore natural phenomena, and to use critical thinking skills to see multiple perspectives and analogies. Copernicus is the largest science institution in Poland and remains one of the country's top attractions.	The Pavilhão do Conhecimento began as the Knowledge of the Seas Pavilion in EXPO 98', which during its 132 days, was visited by 2,543,914 visitors. In July 1999, the museum reopened in the pavilion building with the goal to promote scientific and technological education. Today the museum encourages the public to share and discuss new ideas while bringing the values of social progress based on curiosity, creativity, and critical thinking of all citizens to the forefront of all exhibitions, programs, and activities.	Deutsches Museum was founded in 1903 by engineer Oskar von Miller. Since 1925, the museum has been located at its current location on an island on the river Isar. Throughout the nearly 100 years at its current location, the museum has undergone several renovations and expansion projects with the most notable related to repairs after extensive damages during World War II. The museum's exhibitions galleries contain interactive and multimedia exhibits with explanatory panels, images, and videos. Deutsches Museum has three satellite locations; Deutsches Museum Verkehrszentrum (locomotive and automotive museum), Flugwerft Schleissheim (aviation museum), and Deutsches Museum Bonn (small science and technology museum). The museum is currently refurbishing 269,100 square feet of exhibition space. Phase 1 of the refurbishment is expected to open in 2021 and the second phase is expected to be completed in 2028. Deutsches Museum is the world's largest science and technology museum attracting 1.4 million annual visitors.	ArtScience Museum in Singapore opened to the public in 2011. The museum houses 21 gallery spaces and only one permanent exhibition: Future World: Where Art Meets Science. ArtScience Museum mostly shows temporary exhibitions curated by other institutions and has previously shown works by some the world's most renowned artists including Leonardo Da Vinci, Salvador Dalí, Andy Warhol, Vincent Van Gogh, and M.C. Escher. Scientific exhibitions have explored subjects such as paleontology, space exploration, big data, particle physics, cosmology, and marine biology.

Name	Glasgow Science Centre	City of Science and Industry	Experimentarium	NEMO Science Museum	Phaeno Science Center	Universum-Bremen	Ciudad de las Artes y las Ciencias	Copernicus Science Center	Pavilhão do Conhecimento	Deutsches Museum (Munich Science Centre)	ArtScience Museum
Recently Relocated/Revisioned	In 2013, the third floor was renovated to house a new interactive exhibition, BodyWorks.	N/A	In 2017, the centre opened after a renovation and expansion project by CEBRA that doubled the exhibition space and included a central copper staircase, a rooftop terrace, glazing expansion on the main façade of the building, and a stacked configuration, elements that are reflective of centre's science and technology focus.	In 2019, opened The Studio; an adjacent space used for public programming. The Studio houses interactive exhibitions and temporary exhibitions.	N/A	In 2007, new temporary exhibit building was built adjacent to the main building. In 2015, the centre was completed renovated with new exhibits focusing on three areas; technology, people, and nature.	N/A	N/A	In 2019, the museum's main corridor was redesigned as a optical illusion.	The museum is currently refurbishing 269,100 square feet of exhibition space and the refurbished exhibits are expected to open in 2021. The museum also has three satellite locations.	N/A
Building Size of Centre/Museum (sq. ft.)	120,000	1,600,000	289,010	N/A	129,167	N/A	452,084 (Science Museum Only)	190,090	N/A	N/A	50,000
Exhibition Space (sq. ft.)	N/A	N/A	123,785	53,820 (main building)	96,875	43,055	279,862 (Science Museum Only	67,382	30,655	785,765	N/A
Outdoor Programming Space	Yes - Pacific Quay outside the centre will be transformed to create learning spaces with hands-on exhibits, seating and sculptures along the Clyde side	Yes - located in a park, Argonaute (submarine museum) is also located outside the main museum	Yes - The Wave exhibition and The Interactive Roof are located on the centre's rooftop terrace	Yes- Rooftop: -available for private events -restaurant -outdoor interactive gallery "Energetica" -also known as the "highest city square" in the country	Yes - Covered outdoor plaza	Yes - 53,820 sq. ft. outdoor park with water feature	Yes: -Open-air concert stage -Outdoor exhibit: In the Face of Change, Let's Change (human intervention, climate change) -Outdoor terrace with tables and seating	N/A	Yes - outdoor balcony and outer space courtyard are used for events and private functions	Yes - the museum courtyard is used to hold museum events and programs. Science Summer: An open-air program with demonstrations, science shows, lectures and hands-on activities takes place outside daily from 12 noon	N/A
Attendance											
On-Site Attendance	316,000 (estimated)	5,000,000	456,621	655,505	N/A	450,000	4,000,000 (full complex)	1,078,028	N/A	1,400,000	N/A
Off-Site Attendance	N/A	N/A	N/A	N/A	N/A	N/A	N/A	159,583	N/A	N/A	N/A
Visitor Breakdown	N/A	N/A	N/A	N/A	N/A	N/A	N/A		N/A	N/A	N/A
Students Served On-Site	72,000 (estimated)	N/A	N/A	170,430 (estimated)	N/A	N/A	N/A	255,568	N/A	N/A	N/A
Students Served Off-Site	N/A	N/A	N/A	N/A	N/A	N/A	N/A	138,176	N/A	N/A	N/A
General Admission 2023											
Adult	£36.00	€ 12.00	DKK 215	€ 17.50	€ 15.00	€ 14.40	€ 8.00	37 zł	€ 11.00	€ 8.00	S$50
Senior	£30.00	€ 12.00	DKK 25	€ 17.50	€ 12.00	€ 14.40	€ 6.20	37 zł	€ 8.00	€ 8.00	S$38
Student	£36.00	€ 12.00	DKK 135	€ 17.50	€ 10.00	€ 14.40	€ 6.20	37 zł	€ 9.00	€ 8.00	S$50
Child	£30.00	€ 9.00	DKK 135	€ 17.50	€ 5.00	€ 14.40	€ 6.20	37 zł	€ 8.00	€ 8.00	S$38
Program, Exhibits, & Events											
Public Programs/Education	●Autism Friendly Hours ●Workshops ●School Field Trips ●GSC On Tour (outreach program) ●Community Learning and Development (short courses and discovery visits) ●Home Educators (discounted visits to the centre) ●Online teaching resources available GSC has several educational partners that support/partner on programs	●Hidden Readings (for children aged 3-6 in youth library) ●Conversation in French (program for French leaners) ●Review and Strengthen Your Academic Knowledge ●Science Clubs (ages 9 to 14, 9 to 13, or 7 to 12; covers robotics, astronomy, and various science topics) ●City of Health: offers resources to visitors both online and in person who struggle with health concerns and require support. ●Digital Crossroads: collaborative space with the following: -Fab Lab Tutorials (ex. #D modelling) -Events/Collaborative Projects (ex. Light the Night, Imaginary Journeys, Digital Book Hackathon, Towards a more responsible digital)	●School field trips (for students under the age of 18)	● School field trips - available for students in primary and secondary - includes a "Science all around you" live demonstration, followed by self-guided tour ●Outreach education programs are available	●"Learning at home and in the classroom" - registered program for schools (grades 5-10) offered on YouTube live stream ●School Trips; tours, workshops, experiments, and live stream available based on selected educational programs. ●In house teacher training/professional development course ● ** Lots of programs available online	●School field trips; customizable based on educational flyer ●Company visits/team building for groups of 15 or more	Specific to Science Museum: ●School field trips with Workshops: -Scientist for a day -Vacuum horror -Chemistry magic -Cold, cold -Multimedia gallery demos -TV Studio -Robotics -Red Hot -Drones -Natural Music ● Professional development courses and training for teachers ● The Children's Council - gives children the opportunity to comment on the Museum's workshops, exhibits, and programs	●Young Explorer's Club (supervised experiments) ●ESERO (European Space Agency program aimed at students and teachers) ●Dream Builders (educational program that supports STEM learning) ●Science for You (Joint program with the centre and Ministry of Science and Higher Education aimed at providing greater access to science) ●Outreach Programs: -Mobile Exhibits -Mobile Nature Labs -Science Shows	●Living Science School; educational program that offers: -Meeting Scientists -Exhibit Tours -Lab Activities -Classroom Activities ●Reading booth; a mini library where visitors can borrow books ●Doing: A workshop space divided into two spaces: -Tinkering (activities that make us think with our hands) -Maker (visitors develop their own projects) ●Living Science Clubs (at schools) ●School field trips (aligns with curriculum) ●Science Minutes: program presented throughout exhibitions that focus on STEM ●Discover the World Outside (resources for educators and families for local learning) ●Experiences Outside of Doors (registered program for those 60+; permits on onsite access to locations usually closed to the public)	●School field trips: customizable to cover any of the subject areas in the museum' exhibitions ●Kerschensteiner Kolleg - training seminars and multi-day events related to the museum's exhibitions ●Guided Tours ●Science Summer: An open-air program with demonstrations, science shows, lectures and hands-on activities takes place daily from 12 noon	●Guided Tours (now virtual) ●School trips are available in the following options: -Self-Guided Visit to Exhibition(s) -Visit to Exhibition(s) with Guided Tour or Workshop -Visit to Exhibition(s) with Guided Tour and Workshop ●All programs and activities have been moved online
Events/Activities	●Planetarium Shows (including late showings) ●The Fulldome Experience: Inspired by Pink Floyd ●Science Show Theatre ●Glasgow Tower (panoramic views) ●IMAX Cinema Screenings (includes popular movies from time to time) ●SCI-FI Sunday Films ●Space Zone ●Little Explorer Days (aged 3-5) ●Curiosity Live (STEM) ●Halloween Spooktacular ●From Deep Time to Deep Space (films and corresponding lectures) ●World Space Week ●Science Lates (after hours for adults) ●The Universe for Beginners (Astronomy night classes for adults) ●David Elder Lectures (older teens and adults) ●The Science of Whisky (Adults only) ●Co-Design to Connect: Shaping Cultural Science Events at GSC	●Planetarium Shows ●Cinema Shows ●Workshops (ex. "City of the Future" and lego robotics) ●Science Internships (for adults, children, and families) ●Science Festival ●European Sustainable Development Week ●City of Adventures Festival ●Pitcher Your CV: Make a Story out of it (CV workshop)	●Interactive Film Theater ●Science shows -The Invention show -The Experimentarium Bubble Show ●Live demonstrations: -From magnetism to offshore wind farms -Oil on fire -An eye for detail -CO2 and the greenhouse effect -Dissection of the digestive system	●Science all around you (live demonstrations) ●Laboratory (visitors can participate in hands-on chemistry experiments) ●Maker Space (Workshops for children 8+) ●Chain Reaction (live demonstrations)	●Autumn Holiday Program: - laser shows - laser maze - live demonstrations ●Phaenomenale (biennial festival for digital, art and culture in Wolfsburg) ●"Pale Blue Dot" - Collective community art project ●Hands-on laboratories: -Robot workshops -Woodturning workshops	●Science shows ●Lectures ●Dinner in the dark ●Café in the dark	Specific to Science Museum: ●Free conferences -Topics include astronomy, health, biology, natural disasters, climate change, the brain ●Live demonstrations and science shows ●General Workshops: -Science to Scene and TV Studio ●Passport to Space (astronomy related activities) ●Outdoor music concerts ●Guided Tours	●Robotics Theatre (shows starring robots) ●Thinkatorium (Makerspace) ●"Lates" 18+ (after hours events for adults only, includes themed interactive activities and displays) ●Planetarium: -live shows, films, popular tv shows, and concerts ●FabLab (visitors can design and build various objects) ●Learning Adventures (Informal learning conference, held after hours for adults)	●Wind Pipes ●Marbles machines ●Scribble machines ●Electrical circuits ●Robotics station ●Film Screening ●Live Science Circuits: pre-set self-guided tours around various organizations created to help visitors discover culture and science ●Interactive Modules: -Flying Bike -Spiral Illusion -Giant Table -The Shrinking Chair -Slow Bubbles -Balancing the Rods -Hands in the sand -Help yourself to the Head -Laser Harp ●Activities for those 60+: -Table Detectives -Lizards and Butterflies -Machines and Engineers -Vegetables at the Window -Tea with Science	●Live demonstrations ●Inventors' Trails" trail available online and in person: -The Trail of Discovery -The Trail of Communication -The Trail of Drivetrains -The Trail of Energy -The Trail of Mobility ●Lecture series: Science is for Everyone ●Vintage model airplane events ●Sightseeing	●Family Fridays (reduced ticket entry for families) ●Talks at ArtScience Museum ●ArtScience Late: local artist performances ●ArtScience on Screen ●Special Event: Let's Talk About (for youth aged 6-12) ●Workshops: -Make Your Own: Lantern -Make Your Own: Peace Sign -Make Your Own: Shrink Art with Recycled Plastics

Name	Glasgow Science Centre	City of Science and Industry	Experimentarium	NEMO Science Museum	Phaeno Science Center	Universum-Bremen	Ciudad de las Artes y las Ciencias	Copernicus Science Center	Pavilhão do Conhecimento	Deutsches Museum (Munich Science Centre)	ArtScience Museum
Digital/Virtual	●GSC AT HOME -Daily videos available at 10am. Videos are uploaded to YouTube, Facebook, Instagram, Twitter.	●Digital Crossroads: collaborative space with the following: -Fab Lab Tutorials (ex. #D modelling) -Events/Collaborative Projects (ex. Light the Night, Imaginary Journeys, Digital Book Hackathon, Towards a more responsible digital) Fab Lab Tutorials are available online ●City of Health: offers resources to visitors both online and in person who struggle with health concerns and require support.	●A pre-recorded Invention Show is available online for view	●Step-by-step activities are available online, divided into three categories: -Did you know? -Do it yourself -Test yourself	●Phaeno Science Slam - science experiments on YouTube live stream ● "Learning at home and in the classroom" - registered program for schools (grades 5-10) offered on YouTube live stream ●360 Virtual Exhibition Tour ●Experiments to Imitate (pre-recorded experiment videos) ●Phaeno Exhibits Explained (pre-recorded series) ● Phaeno Puzzle with the Physicists (pre-recorded series) ●Downloadable colouring pages	●Virtual tours available for each perm gallery ●Universum® for the home - instructional video experiments	●Virtual tours available	●In person yearly conference, Pass 2020, has been moved online	●Virtual Interactive Tour of the Museum ●Explora Interactive Virtual Tour, covers topics of: -Light -Eyesight -Perception -Waves -Complex systems ●Several pre-recorded videos about the centre, events, science lab, and interviews ●Educational resources available online including exhibitions work guides and live science resources	●Museum App; has interactive maps, museum highlights, and exhibition information ●Inventors' Trails® trail available online and in person: -The Trail of Discovery -The Trail of Communication -The Trail of Drivetrains -The Trail of Energy -The Trail of Mobility	ArtScience at Home. The following activities and programs have been moved online and are free: ●Talks at ArtScience Museum ●ArtScience Late: local artist performances ●ArtScience on Screen ●Special Event: Let's Talk About (for youth aged 6-12) ●Workshops: -Make Your Own: Lantern -Make Your Own: Peace Sign -Make Your Own: Shrink Art with Recycled Plastics
Perm Exhibitions	●IDEA NO59 (Natural resources, industry technology, health) ●A Question of Perception (illusions) ●Bodyworks (biology) ●Powering the Future (Energy, natural resources) ●The Big Explorer (Kid's gallery, various activities/topics) ●Quantum Technologies ●Project Lab (Gives visitors the chance to offer opinions on changes happening at GSC)	●Br4in ●Man And Genes ●Transport and Mankind ●Energy ●The Great Story of the Universe ●Earthwatch: the satellite revolution ●Mathematics ●Sounds ●Pinhole, representation of space ●Argonaute (submarine museum) ●The "reverse" sundial ●Cité des enfants (children's gallery for children aged 2-7 years)	●The Port (global trade) ●Bubblearium (bubbles, light) ●Tunnel of Senses ●The Wave (maritime) ●Construction Site (architecture, engineering) ●Under your Skin (biology) ●Energy Zone ●The Idea Company (inventions) ●Be Seen Be Safe (traffic, pedestrians, cycling) ●The Test Center (rapidity, reactivity, mental strength, precision) ●The Miniverse (Children's gallery for 1-5 year olds) ●Labyrinth of Light (Light, colour) ●The Puzzler (logic, riddles) ●Yeast Cell (micro-organisms) ●The Interactive Roof (Play area) ●Circus Physicus ●PULSE Plaza (Physical Activity) ●The Beach (Water)	●Humania (biology, race, sociology, psychology) ●Sensational Science (light, sound, static electricity) ●World of Shapes (geometry, perspective) ●The Machine (process, motion, transportation) ●Energetica (Energy, hands-on play) ●Life in the Universe (space) ●Energize (renewable resources, motion) ●Water Power ●Amazing Constructions (construction, shapes, forces, equilibrium) ●Science throughout the Ages ●Innovation Gallery (technological development over time)	● The World of Phenomena: contains 350 exhibits covering topics such as: -colour and pattern -water and waves -static electricity -construction and building -food -mechanics -chaos and order	●Technology (daily electronics, daily tech) ●Human (biology) ●Nature ●Milky Way children's area	●Communication Arcs (Sounds) ●On Wheels (transport) ●The Ant's Nest (nature, habitats) ●The Kiddie's Corner (dedicated gallery for children 3-8 years old) ●DNA ●Foucault's Pendulum (Space, earth's travel pattern) ●The Legacy of Science ●Zero Gravity ●Space Simulator ●Chromosome Forest (Biology, DNA, genetics) ●To Fly (flight) ●Outdoor exhibit: In the Face of Change, Let's Change (human intervention, climate change)	The Experimental Zone (the centre's perm exhibition hall, contains over 400 exhibits including the following) ●On the move, Humans and the environment ●Roots of civilization ●Lightzone ● RE: generation started (dedicated teen space) ●Buzz! (dedicated children's exhibit for those 5 years and younger)	●Step into Space ●Tcharan! Circus of experiences (Circus experiences for 3-12 year olds)	35 different exhibitions including: ●Astronomy ●Centre for New Technologies ●Ceramics ●Chronometry ●Computers ●Electric Power ●Energy Technology ●Environment ●Glass Technology ●Hall of Fame ●Historic Aviation ●History of the Museum ●Kids' Kingdom ●Marine Navigation ●Metals ●Microelectronics ●Oceanography ●Pharmaceutics ●Technical Toys	●Future World: Where Art Meets Science ●The Museum has one perm exhibition and tends to host travelling exhibitions with emphasis on digital and multimedia. Currently on show: -Planet or Plastic?
Temporary (Y/N)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Special Features	●IMAX Cinema ●Science Show Theatre ●Planetarium ●Glasgow Tower (only structure on earth capable of rotating 360° into the prevailing wind and holds the Guinness World Record for the tallest fully rotating freestanding structure in the world - 127m high) ●Project Lab (Gives visitors the chance to offer opinions on changes happening at GSC) ●Whitelee Windfarm Visitor Centre	At 1.6million sq. ft. it is the largest science centre in Europe. ●Argonaute (submarine museum) ●Cinema ●Planetarium ●Aquarium ●Science and Industry Library ●City of trades	●Interactive Film Theater ●Outdoor programming space - The Wave exhibition and The Interactive Roof are located on the centre's rooftop terrace	●The museum is built on top of a tunnel ●Roof Terrace: -available for private events -restaurant -outdoor interactive gallery "Energetica" -also known as the "highest city square" in the country ●Second, smaller building "The Studio" located adjacent to the main museum.	● Science Theatre ●Architectural Tours ● Outdoor public plaza	●Outdoor Programming space: 53,820 sq. ft. outdoor park with water feature	●The site contains 5 different buildings: -Hemisféric (theatre building) -Oceanogràfic (Aquarium) -Science Museum -Umbracle (Indoor garden) -Palau de les Arts -Àgora (event space) ●On-Site Catering ●Three Restaurants including a Submarine Restaurant with underwater views (in the aquarium building) ●Hemispheric Building: -contains an IMAX theatre, 3D digital cinemas, and digital projects used for screens and planetarium shows ●Science Museum: -Science Theatre ●Outdoor exhibit: In the Face of Change, Let's Change (human intervention, climate change)	●Planetarium: -live shows, films, popular tv shows, and concerts ●The centre co-hosts "Science Picnic" with Polish Radio; the largest outdoor science event in Europe (held offsite)	●Several activities/programs for people 60+ ●Emphasis on science educational programming	●World's largest science and technology museum ●Leader in research. Home to: -The Research Institute for the History of Science and Technology -Scholar-in-Residence Program -Publication Prize of the Deutsches Museum ●Numerous exhibitions various science and technology subjects	●Programs and activities have moved online and are free to access ●The Museum has one perm exhibition, Future World: Where Art Meets Science. Tends to host travelling exhibitions with emphasis on digital and multimedia. Currently on show: -Planet or Plastic?
Rental Program	●Private events are available in the following spaces: -Atrium -Boardroom -Clyde Suite -Floor One -Floor Two -Floor Three -Science Show Theatre -Science Street -Space Zone -Taste Café -Planetarium -Tower Base North -Tower Base South -The Hive	● Yes - could not confirm details	●Rentals are available for corporate meetings and conferences	●Private events are available in the following spaces: -Museum Exhibitions -Panorama Room -Restaurant and Conservatory -Auditorium -Café -Boardroom -Theatre -Entrance Hall -Event Hall -Rooftop Square -Studio	●Private events are available in the following spaces: -Museum Exhibitions -Boardrooms -Science Theatre -Dedicated Banquet area -Ideas Forum * The centre also offers entertainment programs/performers along with facility rental	●Yes - specific space details not available	●Yes - on site cratering in available, specifics for the science museum are unknown		●Private events are available in the following spaces: -Auditorium -Atrium -Library -The Kitchen is a Laboratory -Clock Room -Exhibition Area -Outdoor Balcony -Outer space -Garage	●Private events are available in the following spaces: -Historic maintenance hangar -Lilienthal hall -Exhibition hall -Wright gallery -Montgolfier room	●Private events are available in the following spaces: -Level 1 Lobby -Level 4 Galleries -Basement 2 Circulation & Ocutus -Future World: Where Art Meets Science Exhibition

Appendix G

The Government's Announced Vision for Ontario Place

NEWS RELEASE

Province Announces Ontario Place Redevelopment

New partnerships will help make vision of a world-class, year-round destination a reality

July 30, 2021

Office of the Premier

TORONTO — The Ontario government has announced details of its plan to revitalize Ontario Place into a world-class destination. Three successful participants from the 2019 Call for Development process Therme Group, Live Nation and Écorécréo Group will help deliver an exciting, inclusive and family friendly experience that will play a key role in the province's post-pandemic recovery, both as a tourism destination and as a display of Ontario's strong cultural identity. The government also outlined the next phase of consultations with stakeholders and community members.

Details were provided today by Premier Doug Ford; Lisa MacLeod, Minister of Heritage, Sport, Tourism and Culture Industries; John Tory, Mayor of Toronto; Chief R. Stacey Laforme of the Mississaugas of the Credit First Nation; Robert Hanea, CEO of Therme Group; Wayne Zronik, President of Business Operations at Live Nation Canada; and Jean-Philippe Duchesneau, Co-Owner of Écorécréo Group.

"As we mark the 50th anniversary of Ontario Place this year, there is no better time to bring this iconic destination back to life," said Premier Ford. "By taking this first step with our world-class development partners, as well as the City of Toronto and Indigenous communities, we will deliver a renewed Ontario Place that provides year-round entertainment for all ages and interests. As we continue to engage and consult with the community, Ontario Place will realize its full potential as a long-term economic generator for the people of Ontario."

The transformation of Ontario Place will include three new major attractions:

- Therme Group is building Therme Canada | Ontario Place, a family-friendly, all-season destination offering something for all ages, including pools, waterslides, botanical spaces to relax, as well as sports performance and recovery services. Outside, people will enjoy more than eight acres of free, publicly accessible gathering spaces, parkland, gardens and beaches.

- Live Nation is redeveloping the existing amphitheatre into a modern, year-round indoor-outdoor live music and performance venue that will attract world-class artists and events. Protecting the iconic amphitheatre lawns, the new venue will have an expanded capacity of 20,000 in the summer and close to 9,000 in the winter, offering a unique indoor-outdoor experience with operable exterior walls to accommodate events, rain or shine.
- Écorécréo Group is building an affordable, all-season adventure park for all ages. This new, environmentally friendly attraction will include aerial obstacle courses, net-based aerial adventures, ziplines, climbing walls, escape rooms and many other activities. Écorécréo Group will also operate Segway, quad-cycle, canoe and kayak rentals at the site.

The province actively searched for the best partners from around the world to work with on the redevelopment of Ontario Place. Potential development partners on this unique opportunity were assessed against four primary areas of consideration: alignment with the government's vision of a world-class, year-round destination; concept viability; delivery certainty; and costs and benefits to the province, as well as public feedback and input provided through consultations conducted by previous governments. This fair, transparent and open process was designed and facilitated by Infrastructure Ontario and its advisors (KPMG and Colliers) to provide flexibility for interested parties to propose unique, yet financially viable and sustainable, development concepts.

"When Ontario Place opened in 1971 under the leadership of Premier Bill Davis, it was designed to reflect all that we, as Ontarians, embodied: our heritage, our diversity, our creativity and our future potential. Ontario Place holds a special place in our hearts and minds thanks to the countless family friendly events and activities that have been enjoyed there over the past 50 years," said Minister MacLeod. "Our government remains committed to redeveloping Ontario Place in a sustainable way – respecting our historical and natural features while at the same time showcasing Ontario as the world in one province – a true reflection of our diversity and multiculturalism, while also showing respect for the rich traditions, cultures and heritage of First Nation, Inuit, and Métis peoples. A modern, new Ontario Place will attract local, provincial and international visitors, and create unforgettable memories for a new generation."

As the redevelopment moves forward, public input will be critical to support the planning and development of the site. Mark Saunders, Special Advisor for Ontario Place, will continue to engage with the City of Toronto, Indigenous communities,

project stakeholders, businesses and community groups that have interest in the Ontario Place site to ensure all perspectives on these important proposals are recognized and considered.

Starting in August, the government will launch the next phase of engagement through Ontario.ca/OntarioPlace, providing an opportunity for all Ontarians to share how they would like to experience a redeveloped Ontario Place. Virtual public information sessions will also be held in the fall with planning and development consultations related to the site-wide environmental assessment, heritage, and site servicing to follow later in the year. The redevelopment website,Ontario.ca/OntarioPlace, will be kept up to date with the latest information about planned public and stakeholder engagement.

Across the site, public spaces will be enhanced and brought up to modern standards with new parks, promenades, trails and beaches. Key heritage and recreational features of the site will be retained and integrated into the redevelopment, including the Cinesphere, the pod complex, the marina, Trillium Park and the William G. Davis Trail. The province will also work with the Ontario Science Centre to explore opportunities to have science-related tourism and educational programming at the Cinesphere and pod complex.

A redeveloped Ontario Place will not include casinos or condos and the land will not be sold. Ontario Place will remain open to the public 365 days a year, with free public access and a waterfront experience that can be enjoyed by all.

“We are committed to working with the City of Toronto, Indigenous communities and organizations, and other key partners to make this vision a reality and to guide collaboration and future development of the Ontario Place and Exhibition Place sites,” said Minister MacLeod. “Our government is committed to engaging and keeping the public and stakeholders informed. As we move forward, public input will be critical to support the planning and development of the site. More information about upcoming consultations related to redevelopment planning will be provided later this summer.”

Quick Facts

- Redevelopment is expected to create over 3,600 construction jobs and staff positions once the attractions open to the public, with approximately five million visitors expected annually.
- The Ontario Place site is a unique waterfront site, made up of approximately 155 acres of land and water, and served as an iconic cultural and tourism

destination for all Ontarians between 1971 and 2012.
- The government launched a Call for Development on May 28, 2019 and received submissions until September 24, 2019.
- Currently, more than one million people visit Ontario Place every year.

Quotes

"I've said publicly many times that I want to see something spectacular here at Ontario Place and I believe this ongoing process will deliver that. I welcome the fact that the proposals being unveiled today respond to many of the things City Council had asked for including that Ontario Place should be a year-round destination. The City of Toronto looks forward to continuing to work with the Province as these proposals are developed and we look forward to a genuine and thorough engagement of the people of Toronto and beyond."

- John Tory
Mayor of Toronto

"Working with our partners and stakeholders, we are excited to be playing a part in the future of Ontario Place, and opening up new opportunities for people to connect with the waterfront. We chose Toronto to be our launching point in North America because of the unique culture and vision of the city and Ontario Place, and we are committed to carrying on its legacy with renewed family entertainment, public parks, and well-being and cultural programming."

- Robert Hanea
CEO of Therme Group

"We couldn’t be more excited to be growing the amphitheatre into a year-round venue that will bring even more opportunity for fans to experience world class live music on the lakeshore. We look forward to continue working with the Ontario government around the redevelopment of Budweiser Stage."

- Riley O’Connor
Chairman, Live Nation Canada

"As a Canadian-based organization, our team is honoured to have been chosen to contribute to the redevelopment of one of Ontario's most iconic destinations. We are excited to bring an innovative, themed adventure park to Ontario Place – one that creates a magical atmosphere, while offering immersive, family-friendly outdoor activities for all ages."

- Jean-Philippe Duchesneau
Co-owner of Écorécréo Group

"The Mississaugas of the Credit First Nation are pleased to be working with Ontario in the spirit of partnership to bring Ontario Place back to its rightful place as a cherished and celebrated part of our Toronto waterfront. We have been very encouraged by the willingness of both Ontario and development partners to see this project as more than just a tourist destination, but as a celebration of this place and its history and cultural significance. The Mississaugas of the Credit see the redevelopment of Ontario Place as another significant and visible opportunity to provide education and promote reconciliation. And as the Treaty First Nation, we take seriously our responsibilities to ensure that all Indigenous voices are heard, respected and reflected in what will surely become an iconic development not only for Ontario, but for Canada and the world. "

- Chief R. Stacey Laforme
Mississaugas of the Credit First Nation

Additional Resources

- Ontario Place Development Partners
- Ontario Place development
- 2021 Budget - Ontario's Action Plan: Protecting People's Health and Our Economy

Related Topics

Government

Learn about the government services available to you and how government works.

Learn more

Travel and Recreation

Learn more about hunting and fishing, provincial parks, festivals and events, and visiting Ontario. Learn more

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The Bold New Vision

Appendix H

Eglinton Crosstown LRT Information Sheet

Eglinton Crosstown LRT

Backgrounder

The Eglinton Crosstown is a light rail transit line that will run along Eglinton Avenue between Mount Dennis (Weston Road) and Kennedy station. This 19-kilometre corridor will include a 10-kilometre underground portion, between Keele Street and Laird Drive.

The Crosstown will have up to 25 stations and stops. It will link to 54 bus routes, three subway stations and various GO Transit lines.

The Crosstown will provide fast, reliable and convenient transit by carrying passengers in dedicated right-of-way transit lanes separate from regular traffic.

This service will have priority signaling at intersections to ensure certainty in travel times. The vehicles will use the PRESTO proof-of-payment system and will have multiple entrances and low floors to ensure fast and accessible boarding.

Light rail vehicles can travel as fast as 80km/hr. However, actual speed is determined by the spacing of the stops and the speed limits of surrounding traffic. On average, the Crosstown vehicles will travel at 28km/hr.

The projected ridership of the Crosstown is 5,500 passengers per hour in the peak direction by 2031. The capacity of the Crosstown vehicles is 15,000 passengers per hour per direction. Cars can be removed or added easily, thus providing the flexibility to accommodate ridership demands.

Light rail transit is a proven technology that is used around the world, including extremely cold places such as Edmonton, Calgary and Minneapolis.

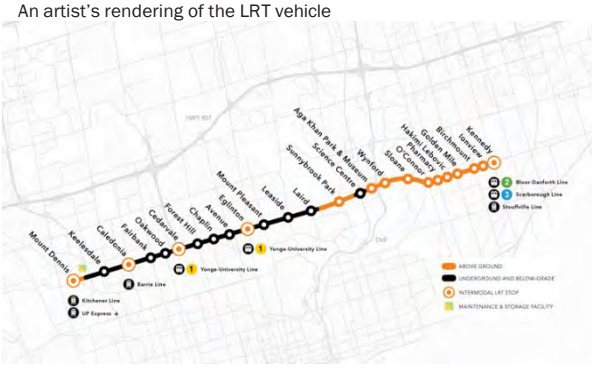
The Crosstown is a $5.3 billion (2010$) investment from the Government of Ontario to expand transit in Toronto. It is the largest transit expansion in the history of Toronto's history.

The Crosstown is currently under construction.

Sample travel times:

	Currently (via bus)	Eglinton Crosstown LRT
Kennedy station to Yonge -Eglinton	40 min.	26 min.
Kennedy station to Eglinton-Keele	73 min.	38 min.
Eglinton-Keele to Eglinton West station	16 min.	6 min.

An artist's rendering of the LRT vehicle



Eglinton Crosstown stations and stops

An artist's rendering of the Laird station

Site at Black Creek Drive where the tunnel boring machines begin tunnelling

Contact us: West Community Office
1848 Eglinton Avenue West (at Dufferin)
416-782-8118 | crosstown@metrolinx.com

EGLINTON CROSSTOWN

METROLINX
An agency of the Government of Ontario

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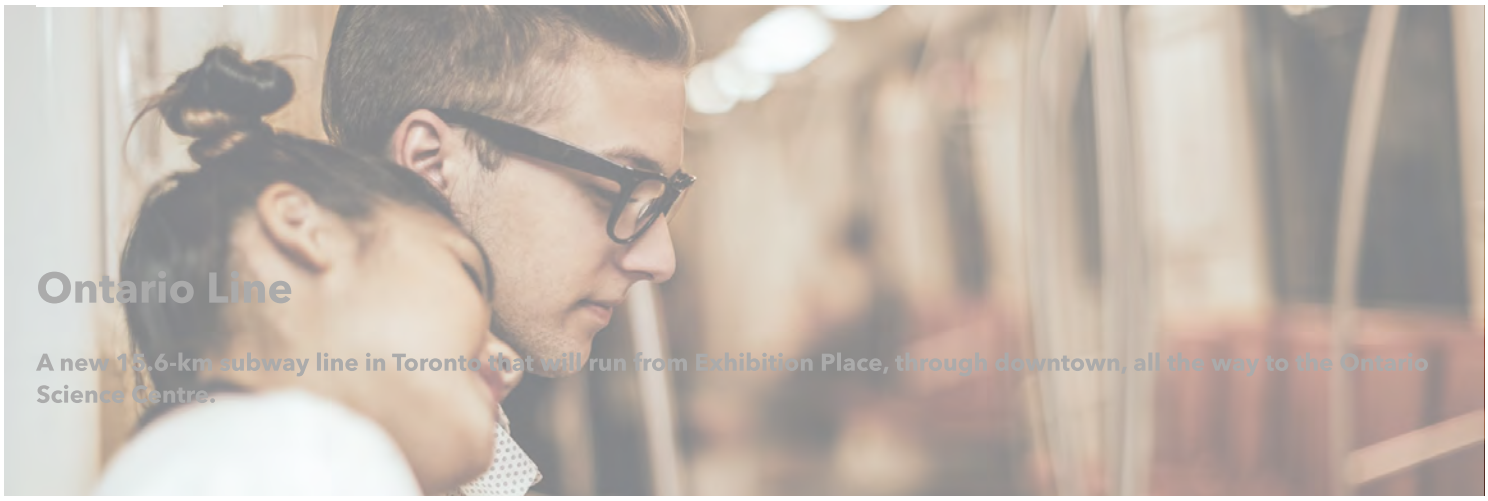


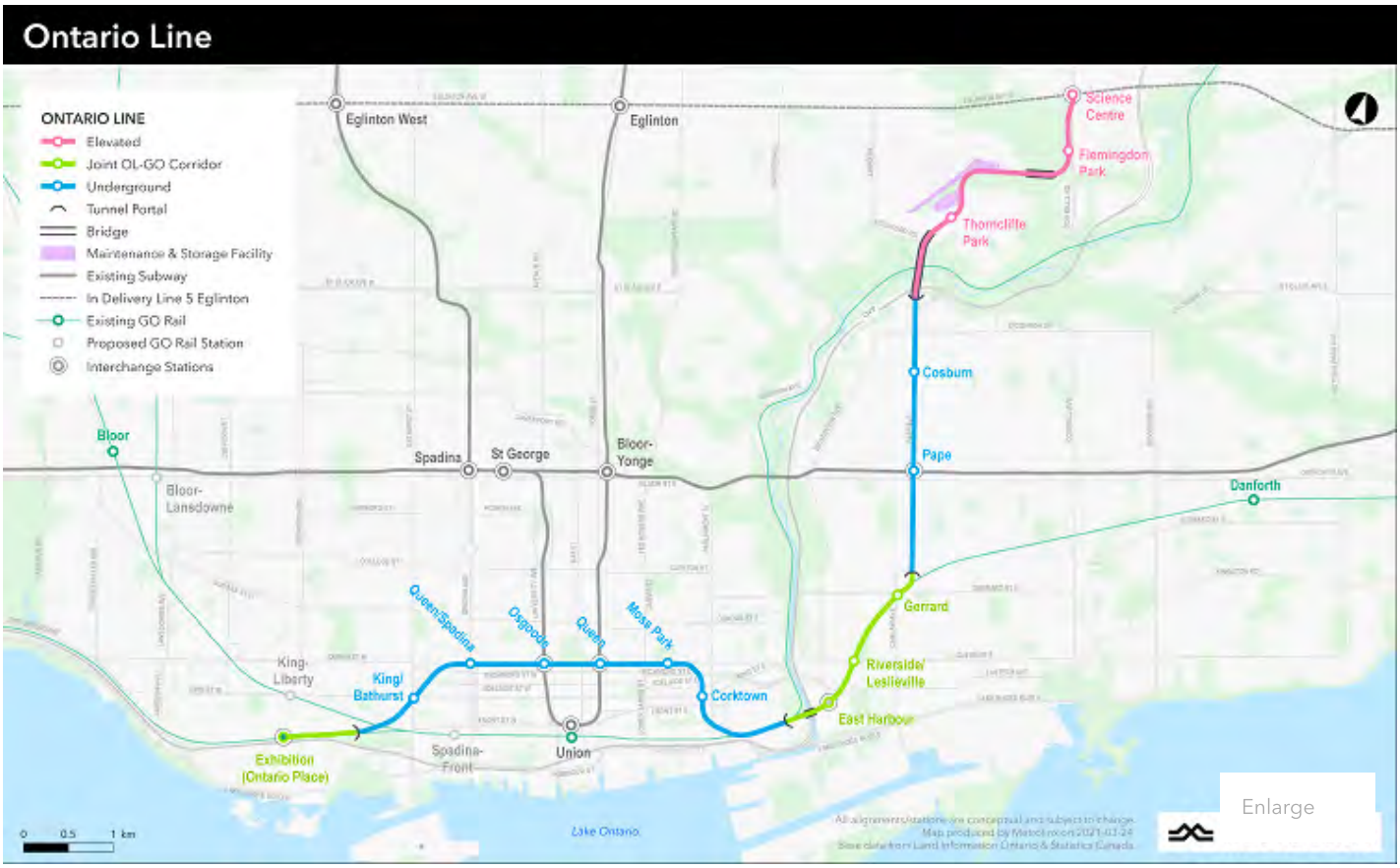
Overview

The Ontario Line will be a 15.6-kilometre subway line that will make it faster and easier to travel within Toronto and beyond.

The line will bring 15 new stations to the city and will run from Exhibition Place, through the heart of downtown, all the way to the Ontario Science Centre. It will give people more time back in their days, with a trip from one end to the other taking less than 30 minutes compared to the 70 minutes it takes on transit today. There will also be significant relief from crowding throughout the existing transit network thanks to connections to more than 40 other travel options along the way, including the TTC's Line 1 and Line 2, three GO Transit rail lines, and the Eglinton Crosstown LRT.

Construction is now underway.

Project map



Key facts

Number of stations	15
End-to-end journey time	30 minutes or less
Connections to other transit options	Over 40, including: • Connections to Lakeshore West, Lakeshore East, and Stouffville GO train services • Connections to the TTC's Line 1 and Line 2 subways • Connection to Line 5 (Eglinton Crosstown LRT) • Connections to streetcar lines at 10 Ontario Line stations • Connections to bus services at 12 Ontario Line stations
Route length	15.6 km
Ridership	388,000 daily boardings

Frequency	As frequent as every 90 seconds during rush hour
Improved access to transit	227,500 more people within walking distance to transit
Improved access to jobs	Up to 47,000 more jobs accessible in 45 minutes or less, on average • For lower-income residents, up to 57,000 more jobs accessible in 45 minutes or less
Reductions in rush hour crowding	• Up to 22 per cent at Bloor/Yonge Station, or 14,000 fewer people, during the busiest hour • Up to 16 per cent at Eglinton Station, or 5,000 fewer people, during the busiest hour • Up to 14 per cent at Union Station, or 14,000 fewer people, during the busiest hour
Daily reductions in traffic congestion	28,000 fewer cars on the road
Yearly reductions in fuel consumption	7.2 million litres

In the news

Metrolinx addresses concerns surrounding future Osgoode Station

February 3, 2023

Transit agency lays out need for Ontario Line station location & tree removals. **[Read more]**

Big milestones reached for major Ontario Line contracts

November 22, 2022

Awarding two contracts & issuing RFQs for two others brings project closer to major construction. **[Read more]**

Preferred teams selected for two major Ontario Line contracts

September 22, 2022

Identification of delivery partners a big step forward for 15.6-km subway line. **[Read more]**

Find more updates on **Metrolinx News**.

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Sign up for Ontario Line updates

Get updates about the project delivered right to your inbox. You can unsubscribe at any time.

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Timeline

Initial Business Case released	Phased environmental assessment process begins	Preliminary Design Business Case released	Request for Proposals issued for Rolling Stock, Systems, Operations and Maintenance contract	Request f issued fo Civils, S Tunnel
July 2019	September 2020	December 2020	December 2020	Decem

Related Projects

Scarborough Subway Extension

Extending Line 2 subway service 7.8 km farther into the heart of Scarborough.

TORONTO REGION SUBWAYS

Finch West LRT

Finch West LRT will transform the community from Humber College to Finch West Station.

TORONTO REGION

RAPID TRANSIT

Eglinton Crosstown LRT

A midtown connection between east and west Toronto with 25 stations along a dedicated route.

TORONTO REGION

RAPID TRANSIT

Union Station

A better experience at the centre of our network

TORONTO REGION

GO EXPANSION

Land Acknowledgement

Metrolinx acknowledges that it operates on the traditional territory of Indigenous Peoples including the Anishnabeg, the Haudenosaunee and the Wendat peoples. In particular these lands are covered by 20 Treaties, and we have a responsibility to recognize and value the rights of Indigenous Nations and Peoples and conduct business in a manner that is built on the foundation of trust, respect and collaboration. Metrolinx is committed

to building meaningful relationships with Indigenous Peoples, and to working towards meaningful reconciliation with the original caretakers of this land.

Metrolinx, an agency of the **Ontario Government** under the Metrolinx Act, 2006, was created to improve the coordination and integration of transportation in the **Greater Toronto and Hamilton Area** alongside the **Ministry of Transportation**.

Personal information, as defined by the *Freedom of Information and Protection of Privacy Act* (FIPPA), including name, contact information, and opinions/comments, is collected under the authority of the *Metrolinx Act*, 2006, and in accordance with FIPPA. Personal information you provide will be used, as requested, to respond to your enquiries; register you for a live event; book a meeting with a Metrolinx representative; allow you to participate in a survey; add you to an e-mail list that may send promotional messages; or otherwise provide you with a personalized experience. For questions, contact: Manager, Customer Care, Metrolinx, 20 Bay St, Suite 600, Toronto, ON M5J 2W3, (416) 869-3600.

97 Front Street West, Toronto, ON M5J 1E6, Phone: 416-874-5900

Appendix I

Financial Model and Assumptions

Ontario
Infrastructure Ontario

Ontario Place Analysis

Strictly Condifential & Commercially Sensitive

Model Author:
IO Project Lead:
Last Modified By: Logan Davis

Client: Ontario Ministry of Tourism, Culture & Sport
Last Modified: 2023-03-06

MODEL GUIDANCE:

This financial model (the "Model") has been prepared by Infrastructure Ontario ("IO") & Ernst & Young ("EY") to assist the Ontario Ministry of Tourism, Culture & Sport in evaluating potential scenarios related to the revitalization of the Ontario Science Centre ("OSC") and Ontario Place ("OP"). In particular, the Model compares the NPV of two options, the Remain on Site option, where both entities continue to exist and operate in their current locations, and under a relocation of OSC to OP. The analysis is restricted to evaluating revenues and costs associated only with the OSC and those OP lands directly impacted by a relocation and does not contemplate anciliary operations. The Model draws from a number of sources, both internal and external, to inform inputs. The accuracy of this information and IO's ability to validate it may be inconsistent and is more fully described in the assumptions register.

The Model should not be modified or edited in any way without the assistance/involvement of IO and particularly the Model owner (Transaction Structuring). If not received directly from the model owner, IO cannot warrant that downstream edits made by any party will not result in incorrect calculation or assumption handling, potentially causing in misleading results.

MODEL CELL LEGEND:

Please note the following model conventions;

	Input Cell
	Calculation Cell

Please avoid editing any calculation cell when testing model scenarios

TAB CODING:

Tab in the Model are grouped by colour;

	Version Control, Guidance & Assumptions
	Inputs & Calculations
	Output & Sensitivities

Ontario
Infrastructure Ontario

ASSUMPTIONS REGISTER

ASSUMPTION	DESCRIPTION
General	
General Inflation	Long term project, assume 2% average inflation over the life of the project
Revenue Growth rate	Revenue growth rate assumed lower than general inflation due to ticket price increases historically being less than inflationary increases
Wage Growth	Wage growth based on provided OSC planned yearly salary increases 2022-2024
Discount Rate	Discount rate of 3% to be consistent with IO discount rate assumption used on other projects
Construction Dates	Flag used for construction dates of exhibits and buildings Remain: assume major construction of exhibits starts in 2025 during closure year Relocate: Construction begins in 2025
Construction Duration	Remain: Construction duration of exhibits is spread over 3 years equally, beginning in the closure year Relocate: Construction duration of new building is provided by IO Cost Estimation Team - file: 230217 Capital_Cost_revised.xlsx
Operations Closure Duration	Assumed current location will close for 1 year for major construction activities as per advice from IO Assumed that sponsorship and international sales revenue continue. All other revenues are 0 due to uncertainty around what operations/visitor experiences would continue during temporary closure Assumed that variable costs are zero during this time as these are tied substantially to visitation Assumed that fixed costs continue during closure
Curves	
Number of Visitors	Remain: assumed first two years of operations prior to renovation are FY19/20 values as no renovation has been undertaken during this time. After closure period and renovations complete assume FY18/19 visitation which is an increase over FY19/20 to account for increased visitation for a renovated science center. Estimates provided by OSC and Lord Consulting. Relocate: Visitor numbers are maintained at Remain on Site levels (attending the current OSC) until the completion of construction (Note: changes to interim operations include a revenue reduction. This is not specifically modeled but would reflect reduced operations and visitorship. Specific change to visitor numbers not included to avoid double-counting). In FY28/29 there is a reduction to only 33% of steady state visitors (1,000,000) as the relocate site is only operating for 4 months that year. First year in operations the visitation is assumed to increased transiently to 130% of the relocated steady state visitors during the first full year (2029), then decreased to 119% of steady state in 2030, followed by steady visitorship at 1,000,000 annually thereafter. Estimates provided by Lord consulting
Construction Curve - buildings	This Construction Curve describes the timing and magnitude of capital expenditure associated with construction of the new OSC buildings at OP. Construction of a new OSC building is assumed to require 4 year construction period based on preliminary planning using precedent projects per IO Cost Estimation Team - file: 230217
Construction Curve - exhibits	This Construction Curve for exhibits describes the timing of both exhibit refurbishment and minor repairs to be completed at the current OSC site. In the relocate option the curve describes the spend profile for new exhibit constriction at the Ontario Place site. Remain: assumed equal spread of exhibit costs over 3 years Relocate: assumed exhibit costs are skewed towards the end of buildings construction. Most costs have therefore been assumed in final year of construction
Critical Maintenance Curve	Remain: The current OSC building has approximately $369M of deferred critical capital maintenance required. The critical maintenance curve describes the timing and magnitude of that expenditure. Curve provided in the BCA report Relocate: Under the relocation scenario, critical maintenance is required at the current site to enable operations to continue until the date of the move ("interim operations"). 5 year critical maintenance spend provided by the IO asset renewal team outlining the critical maintenance required at the current site to maintain operations.
FTE Yearly values	Remain: Assume no change in current FTE numbers Relocate: Assume FTE reduction based on Ministry cap, which can be accommodate for reasons including difference in square footage of new site and operational changes compared and with current site. Timing of FTE change coincides with move to new facility.
Revenues	
Revenue Items	Average value from FY2010-FY2020. Scaled by visitation and revenue growth rate
Interim Revenue Impact	Relocate only: Per IO from CCT deck - there will be interim revenue impact prior to relocation due to reduced building footprint and offerings during this time
Operating Grant	Assumed flat $19.4M as the operating grant increases are historically not consistent and currently there are no plans to increase the operating grant. The oeprating grant is used only in the fiscal impact assessment and is not incorporated into the cash flow calculations
Capital Costs	
Construction Cost of Buildings	Provided by IO Cost Estimation Team based on AW Hooker Class D estimate - assumed $321M including escalation

Construction Cost for New Exhibits	Based on AW Hooker report indicating exhibit costs of $66.5M for exhibits in both scenarios (includes both hard and soft costs)
Construction Cost for Cosmetic Upgrades	$150 per square foot provided by IO Asset Renewal on advice from Pinchin for cosmetic upgrades to current site
Decommissioning and decant costs	$20.9M estimate provided by IO Asset Renewal based on Pinchin report on decommissioning
Moving Costs	$4.85M estimate provided by Lord Consulting in 2016 and escalated to 2022 values.
Trailing Obligations - Rent & IO Mgt Fee	$3.77M estimate provided by IO Real Estate Management - assumed no inflation as rent and management fee historically have not followed inflationary trends
Trailing Obligations - Operations	$4.6M estimate provided by IO Real Estate Management - scaled by inflation
Buildings Critical Maintenance	Value has been provided by IO Asset Renewal Mgt based on building condition assessment report. Pinchin BCA estimate adjusted by IO Asset Renewal (40%) to reflect escalation due to market conditions and precedent projects. Remain: $369M for critical maintenance required over 20 years for critical maintenance of the current site. Includes markup of 40% on the inflated Pinchin report estimate for escalation, market conditions, and soft costs. Relocate: $32M for critical maintenance required to continue operation for 5-year interim operations assumed.
Operating Expenses	
General Operations (Fixed Costs)	Average value from FY2010-FY2020. Assumed fixed costs are primarily composed of labour and have been scaled by wage growth rate and number of FTEs compared to baseline (2022)
Ancillary Operations (Variable Costs)	Average value from FY2010-FY2020. Assumed variable costs are scaled by visitation and inflation
Occupancy Costs	Remain: assumed occupancy cost is average value from FY2010-FY2020 and scaled with inflation Relocate: Occupancy cost assumed to be $8/sq at new site and assumed 275,000 square feet of property at the new site, the total occupancy cost is assumed to be $2.2M per year. Cost per square foot provided by Lord consulting based on comparable building costs in the region.
Interim Expense Impact	Relocate only: Per IO from CCT deck - there will be interim expense savings prior to relocation (e.g., due to reduced building footprint and offerings during this time)
Common Areas Maintenance	EY provided estimate based on total anticipated maintenance cost for Ontario place and scaled for OSC based on acreage of land usage. Assumed the OSC site takes 2 acres at Ontario Place.
Lifecycle Costs	Remain: Assumed $7.5M per year based on replacement value of OSC and an annual spend of 1.25% assuming an 80-year useful life. Estimate based on advice from IO asset renewal team Relocate: Assumed $5.6M per year based on total construction costs of new OSC and associated structures (bridges, pods, cinesphere), and an annual spend of 1.25% assuming an 80 year useful life. Estimate based on advice from IO asset renewal team

Severance Cost	One time $7.2M severance cost associated with FTE decline of 35 FTEs. Cost was estimated by IO/OSC in 2016 and has been scaled based on inflation and FTE differences for this

Ontario
Infrastructure Ontario

OPTIONS AND SCENARIOS REGISTER

OPTIONS AND SCENARIOS	DESCRIPTION
Remain on Site	
Scenario 0	Represents remain scenario
Scenario 1	Represents relocate scenario
Scenario 2	Placeholder for second relocate scenario
Scenario 3	
Scenario 4	
Scenario 5	
Scenario 6	
Scenario 7	
Scenario 8	
Scenario 9	

Ontario
Infrastructure Ontario

Fiscal Year			FY2009/2010	FY2010/2011	FY2011/2012	FY2012/2013	FY2013/2014	FY2014/2015	FY2015/2016	FY2016/2017	FY2017/2018	FY2018/2019	FY2019/2020	FY2020/2021	FY2021/2022
ONTARIO SCIENCE CENTRE	**UNIT**	**Avg.**													
Visitors															
Visitors	#	945,745		1,135,496	1,024,337	979,246	983,169	936,439	932,258	914,954	900,225	884,837	766,487	2,149	
Visitors Growth															
	%														
REVENUE															
General Admission	$000	5,146	6,679	6,037	5,082	4,876	5,070	4,615	5,201	5,110	5,556	5,320	4,596	40	
Parking Fees	$000	-	-	-	-	-	-	-	-	-	-	-	-	-	
Revenue from Ancillary Operations															
OMNIMAX Theatre	$000	1,383	2,459	1,682	1,711	1,485	1,462	1,354	1,203	1,278	1,248	1,360	1,044	-	
International Sales and Rentals	$000	1,720	2,405	1,176	1,778	2,021	1,345	1,466	2,605	2,227	1,268	1,744	1,566	964	
Educational Programs and Admission	$000	1,308	1,628	1,244	1,379	1,035	1,222	1,302	1,152	1,281	1,284	1,758	1,421	795	
Recreation & Famility Learning Experiences	$000	1,038	764	845	880	897	971	988	1,127	1,201	1,199	1,170	1,103	-	
Memberships	$000	2,127	2,154	2,300	2,199	2,256	2,382	2,217	2,252	2,247	1,919	1,795	1,703	-	
Concessions	$000	460	635	635	593	520	522	519	428	163	360	433	431	-	
Adult & Corporate Learning Experiences	$000	545	647	613	568	524	543	554	716	484	470	562	415	260	
Sponsorship/Donations	$000	2,564	1,502	1,834	1,885	1,949	2,481	1,333	2,657	2,579	3,510	3,393	4,015	1,838	
Program Support and Other Revenue	$000	121	126	64	72	56	161	151	42	67	144	204	253	56	
Interest Income	$000	202	57	117	155	172	151	119	133	161	287	381	344	155	
General Admission	$/Visitor	5.47		5.32	4.96	4.98	5.16	4.93	5.58	5.58	6.17	6.01	6.00	18.61	
Parking Fees	$/Visitor	-		-	-	-	-	-	-	-	-	-	-	-	
Revenue from Ancillary Operations															
OMNIMAX Theatre	$/Visitor	1.46		1.48	1.67	1.52	1.49	1.45	1.29	1.40	1.39	1.54	1.36	-	
International Sales and Rentals	$/Visitor	1.84		1.04	1.74	2.06	1.37	1.57	2.79	2.43	1.41	1.97	2.04	448.58	
Educational Programs and Admission	$/Visitor	1.40		1.10	1.35	1.06	1.24	1.39	1.24	1.40	1.43	1.99	1.85	369.94	
Recreation & Famility Learning Experiences	$/Visitor	1.12		0.74	0.86	0.92	0.99	1.06	1.21	1.31	1.33	1.32	1.44	-	
Memberships	$/Visitor	2.25		2.03	2.15	2.30	2.42	2.37	2.42	2.46	2.13	2.03	2.22	-	
Concessions	$/Visitor	0.48		0.56	0.58	0.53	0.53	0.55	0.46	0.18	0.40	0.49	0.56	-	
Adult & Corporate Learning Experiences	$/Visitor	0.58		0.54	0.55	0.54	0.55	0.59	0.77	0.53	0.52	0.64	0.54	120.99	
Sponsorship/Donations	$/Visitor	2.80		1.62	1.84	1.99	2.52	1.42	2.85	2.82	3.90	3.83	5.24	855.28	
Program Support and Other Revenue	$/Visitor	0.13		0.06	0.07	0.06	0.16	0.16	0.05	0.07	0.16	0.23	0.33	26.06	
Interest Income	$/Visitor	0.22		0.10	0.15	0.18	0.15	0.13	0.14	0.18	0.32	0.43	0.45	72.13	
REVENUE GROWTH															
General Admission	%			-10%	-16%	-4%	4%	-9%	13%	-2%	9%	-4%	-14%	-99%	
Parking Fees	%			0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Revenue from Ancillary Operations															
OMNIMAX Theatre	%			-32%	2%	-13%	-2%	-7%	-11%	6%	-2%	9%	-23%	-100%	
International Sales and Rentals	%			-51%	51%	14%	-33%	9%	78%	-15%	-43%	38%	-10%	-38%	
Educational Programs and Admission	%			-24%	11%	-25%	18%	7%	-12%	11%	0%	37%	-19%	-44%	
Recreation & Famility Learning Experiences	%			11%	4%	2%	8%	2%	14%	7%	0%	-2%	-6%	-100%	
Memberships	%			7%	-4%	3%	6%	-7%	2%	0%	-15%	-6%	-5%	-100%	
Concessions	%			0%	-7%	-12%	0%	-1%	-18%	-62%	121%	20%	0%	-100%	
Adult & Corporate Learning Experiences	%			-5%	-7%	-8%	4%	2%	29%	-32%	-3%	20%	-26%	-37%	
Sponsorship/Donations	%			22%	3%	3%	27%	-46%	99%	-3%	36%	-3%	18%	-54%	

Program Support and Other Revenue	%			-49%	13%	-22%	188%	-6%	-72%	60%	115%	42%	24%	-78%	
Interest Income	%			105%	32%	11%	-12%	-21%	12%	21%	78%	33%	-10%	-55%	
EXPENSES															
					21,956	21,514	19,845	20,924	20,431	20,314	20,243	21,509	21,468	18,290	20,221
Exhibits and Programs	$	2,413	3,053	3,037	2,396	2,291	1,625	2,727	2,714	2,706	2,556	2,369	1,704	554	2,140
Marketing and Advertising	$	2,283	2,318	3,251	2,330	2,399	2,401	2,162	1,804	2,144	1,755	2,232	2,353	1,299	1,569
Visitor Services	$	3,362	4,426	3,903	3,598	3,563	3,231	3,192	3,116	3,235	3,291	2,924	3,564	2,265	2,474
Facility Operations	$	5,424	6,291	6,505	5,617	5,521	5,099	5,330	5,219	5,142	5,261	5,364	5,177	4,179	4,616
Program Management	$	3,653	3,706	4,067	4,128	3,786	3,510	3,503	3,641	3,518	3,464	3,404	3,504	3,914	3,927
Administration	$	4,189	3,684	4,254	3,887	3,954	3,979	4,010	3,937	3,569	3,916	5,216	5,166	6,079	5,495
Capital Projects	$	-	-	-	-	-	-	-	-	-	-	-	-	-	
Occupancy Costs	$	5,176.7	4,820	5,102	4,926	4,828	5,043	5,150	5,256	5,347	5,474	5,223	5,418	5,226	
Ancillary Operations															
OMNIMAX Theatre	$	1,325	1,650	1,418	1,280	1,383	1,426	1,205	1,291	1,395	1,214	1,370	1,264	584	
International Sales and Rentals	$	1,630	2,652	1,331	1,663	1,772	1,510	1,640	2,197	1,872	1,203	1,728	1,388	938	
Educational Programs and Admission	$	1,988	2,189	2,101	2,177	1,827	1,619	1,657	1,606	1,928	2,173	2,412	2,375	3,060	
Recreation & Famility Learning Experiences	$	782	797	702	751	664	797	767	783	854	871	883	744	375	
Memberships	$	587	754	685	769	728	617	598	504	539	497	498	438	281	
Concessions	$	101	84	95	126	98	117	95	101	120	100	80	73	33	
Interest Expense	$	7	6	46	7	7	-	-		-	-	-	-	-	
Adult & Corporate Learning Experiences	$	369	422	403	345	360	325	421	443	269	335	362	425	428	
Sponsorship/Donations	$	1,349	1,374	1,263	1,306	1,387	1,220	570	1,152	1,274	1,616	1,705	1,996	1,654	
Program Support and Other Expenses	$	265	271	1,312	206	246	127	156	32	18	136	65	355	8	
Bank and Service Fees	$	152	-	-	-	-	218	227	214	189	222	226	224	24	

EXPENSES GROWTH												
Exhibits and Programs	%		-1%	-21%	-4%	-29%	68%	0%	0%	-6%	-7%	-28%	-67%
Marketing and Advertising	%		40%	-28%	3%	0%	-10%	-17%	19%	-18%	27%	5%	-45%
Visitor Services	%		-12%	-8%	-1%	-9%	-1%	-2%	4%	2%	-11%	22%	-36%
Facility Operations	%		3%	-14%	-2%	-8%	5%	-2%	-1%	2%	2%	-3%	-19%
Program Management	%		10%	1%	-8%	-7%	0%	4%	-3%	-2%	-2%	3%	12%
Administration	%		15%	-9%	2%	1%	1%	-2%	-9%	10%	33%	-1%	18%
Capital Projects	%		0%	0%	0%	0%	0%	0%	-100%	0%	0%	0%	0%
Occupancy Costs	%		6%	-3%	-2%	4%	2%	0%	0%	2%	-5%	4%	-4%
Ancillary Operations													
OMNIMAX Theatre	%		-14%	-10%	8%	3%	-15%	7%	8%	-13%	13%	-8%	-54%
International Sales and Rentals	%		-50%	25%	7%	-15%	9%	34%	-15%	-36%	44%	-20%	-32%
Educational Programs and Admission	%		-4%	4%	-16%	-11%	2%	-3%	20%	13%	11%	-2%	29%
Recreation & Famility Learning Experiences	%		-12%	7%	-12%	20%	-4%	2%	9%	2%	1%	-16%	-50%
Memberships	%		-9%	12%	-5%	-15%	-3%	-16%	7%	-8%	0%	-12%	-36%
Concessions	%		13%	33%	-22%	19%	-19%	6%	19%	-17%	-20%	-9%	-55%
Interest Expense	%		667%	-85%	0%	-100%	0%	0%	0%	0%	0%	0%	0%
Adult & Corporate Learning Experiences	%		-5%	-14%	4%	-10%	30%	5%	-39%	25%	8%	17%	1%
Sponsorship/Donations	%		-8%	3%	6%	-12%	-53%	102%	11%	27%	6%	17%	-17%
Program Support and Other Expenses	%		384%	-84%	19%	-48%	23%	-79%	-44%	656%	-52%	446%	-98%
Bank and Service Fees	%		0%	0%	0%	0%	4%	-6%	-12%	17%	2%	-1%	-89%

Ontario
Infrastructure Ontario

Scenario	Remain on Site

Scenario Selector	0

Remain on Site	Remain on Site	Relocation	Relocation B
Scenario	0	1	

GLOBAL OPTIONS	UNITS	VALUE			
General Inflation Rate	%	2.0%	2.0%	2.0%	2.0%
Revenue Growth Rate	%	1.5%	1.5%	1.5%	1.5%
Wage Growth Rate	%	1.0%	1.0%	1.0%	1.0%
Discount Rate	%	3.0%	3.0%	3.0%	3.0%
Model Start Date	Date	2023	2023	2023	2023
Model End Date	Date	2073	2073	2073	2073
Operating Period Length	# of Yrs	50	50	50	50
INPUTS	**UNITS**	**VALUE**			
GENERAL					
Number of Visitors - Current Location Steady State	#	885000	885000	885000	885000
Number of Visitors - Ontario Place Steady State	#	0	0	1000000	1000000
Dates					
Construction/Refurbishment Start	Date	2025	2025	2025	2025
Construction/Refurbishment Duration	Years	3	3	4	4
Operations Closure Start	Date	2025	2025	0	0
Operations Closure Duration	Years	1	1	0	0
Operations Relocate Start	Date	0	0	2028	2028
CURVES					
Construction Curve (Buildings)					
Critical Maintenance - Ontario Science Centre					
Exhibition Construction/Minor Repairs					
FTE Increase					
Yearly Visitors Current Site					
Yearly Visitors Ontairo Place Site					
REVENUES					
Current Site					
Interest	$	202,000.00	202,000	202,000	202,000
OSC Operating Grant	$	19,400,000.00	19,400,000	19,400,000	19,400,000
General Admission (includes Parking Fees)	$/Visitor	7.00	7.00	7.00	7.00
Parking Fees	$/Visitor	-	-	-	-
OMNIMAX Theatre	$	1,382,700	1,382,700	1,382,700	1,382,700
International Sales and Rentals	$	1,719,600	1,719,600	1,719,600	1,719,600
Educational Programs and Admission	$/Visitor	1.40	1.40	1.40	1.40
Recreation & Famility Learning Experiences	$/Visitor	1.12	1.12	1.12	1.12
Memberships	$	2,127,000	2,127,000	2,127,000	2,127,000
Concessions	$	460,400	460,400	460,400	460,400
Adult & Corporate Learning Experiences	$	544,900	544,900	544,900	544,900
Sponsorship/Donations	$	2,563,600	2,563,600	2,563,600	2,563,600
Program Support and Other Revenue	$	121,400	121,400	121,400	121,400
Revenue from Current Operations	$	**$ 8,919,602.52**	**36,745,818.86**	**36,745,818.86**	**36,745,818.86**
Interim Revenue Impact Year 1	$	-	-		
Interim Revenue Impact Year 2	$	-	-	(7,000,000)	(7,000,000)
Interim Revenue Impact Year 3	$	-	-	(7,000,000)	(7,000,000)
Interim Revenue Impact Year 4	$	-	-	(7,000,000)	(7,000,000)
Interim Revenue Impact Year 5	$	-	-	(7,000,000)	(7,000,000)
Interim Revenue Impact Total	$	**$ 14,736,905.04**	**-**	**- 28,000,000.00**	**- 28,000,000.00**
Ontario Place Site					
Interest	$	-	-	202,000	202,000
OSC Operating Grant	$	-	-	19,400,000	19,400,000
General Admission (includes Parking Fees)	$/Visitor	-	-	7.00	7.00
Parking Fees	$/Visitor	-	-	-	-
OMNIMAX Theatre	$	-	-	1,382,700	1,382,700
International Sales and Rentals	$	-	-	-	-
Educational Programs and Admission	$/Visitor	-	-	1.40	1.40
Recreation & Famility Learning Experiences	$/Visitor	-	-	1.12	1.12
Memberships	$	-	-	2,127,000	2,127,000
Concessions	$	-	-	460,400	460,400
Adult & Corporate Learning Experiences	$	-	-	544,900	544,900
Sponsorship/Donations	$	-	-	2,563,600	2,563,600
Program Support and Other Revenue	$	-	-	121,400	121,400

Revenue from Relocation Operations	$	**$ -**	**-**	**36,121,151.25**	**36,121,151.25**	-	-	-	-	-	-	-	-	
Capital Costs (Nominal)														
Ontario Science Centre														
Construction Cost of Buildings	$	-	-	321,153,023	321,153,023	-	-	-	-	-	-	-	-	
Construction Cost for New Exhibits	$	66,500,000	66,500,000	66,500,000	66,500,000									
Square Footage of Public Facing Areas	sqft	284,000	284,000	-	-									
Construction Cost/sqft for Cosmetic Upgrades	$/sqft	150	150	150	150									
Construction Cost of Exhibits	$	**$109,100,000.00**	**109,100,000**	**66,500,000**	**66,500,000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
Buildings Critical Maintenance (Nominal)	$	368,651,662.79	368,651,662.79	32,309,026.00	32,309,026.00									
Total Construction Cost	$	**$477,751,662.79**	**477,751,663**	**419,962,049**	**419,962,049**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
Decommissioning and decant costs	$	-	-	20,915,000	20,915,000									
Moving Costs	$	-	-	4,850,000	4,850,000									
Trailing Obligations - Rent & IO Mgt Fee		-	-	3,770,000	3,770,000									
Trailing Obligations - Operations	$	-	-	4,628,650	4,628,650									
Operations Expenses														
Current Site														
Exhibits and Programs	$	2,412,500.00	2,412,500	2,412,500	2,412,500									
Marketing and Advertising	$	2,283,100.00	2,283,100	2,283,100	2,283,100									
Visitor Services	$	3,361,700.00	3,361,700	3,361,700	3,361,700									
Facility Operations	$	5,423,500.00	5,423,500	5,423,500	5,423,500									
Program Management	$	3,652,500.00	3,652,500	3,652,500	3,652,500									
Administration	$	4,188,800.00	4,188,800	4,188,800	4,188,800									
Capital Projects	$	-	-	-	-									
General Operations	$	**$ 21,322,100.00**	**21,322,100.00**	**21,322,100.00**	**21,322,100.00**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
Occupancy Costs	$	**5,176,700.00**	**5,176,700.00**	**5,176,700.00**	**5,176,700.00**									
OMNIMAX Theatre	$	1,324,600.00	1,324,600.00	1,324,600.00	1,324,600.00									
International Sales and Rentals	$	1,630,400.00	1,630,400.00	1,630,400.00	1,630,400.00									
Educational Programs and Admission	$	1,987,500.00	1,987,500.00	1,987,500.00	1,987,500.00									
Recreation & Family Learning Experiences	$	781,600.00	781,600.00	781,600.00	781,600.00									
Memberships	$	587,300.00	587,300.00	587,300.00	587,300.00									
Concessions	$	100,500.00	100,500.00	100,500.00	100,500.00									
Interest	$	6,666.67	6,666.67	6,666.67	6,666.67									
Adult & Corporate Learning Experiences	$	368,800.00	368,800.00	368,800.00	368,800.00									
Sponsorship/Donations	$	1,348,900.00	1,348,900.00	1,348,900.00	1,348,900.00									
Program Support and Other Expenses	$	265,300.00	265,300.00	265,300.00	265,300.00									
Bank and Service Fees	$	152,000.00	152,000.00	152,000.00	152,000.00									
Expenses from Ancillary Operations	$	**8,553,566.67**	**8,553,566.67**	**8,553,566.67**	**8,553,566.67**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
Interim Expense Impact Year 1	$	-	-	(3,900,000.00)	(3,900,000.00)									
Interim Expense Impact Year 2	$	-	-	10,000,000.00	10,000,000.00									
Interim Expense Impact Year 3	$	-	-	10,000,000.00	10,000,000.00									
Interim Expense Impact Year 4	$	-	-	10,000,000.00	10,000,000.00									
Interim Expense Impact Year 5	$	-	-	10,000,000.00	10,000,000.00									
Interim Expense Impact	$	**10,695,233.33**	**-**	**36,100,000.00**	**36,100,000.00**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
One-Time Costs	$	**8,553,566.67**	**8,553,566.67**	**8,553,566.67**	**8,553,566.67**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
Lifecycle Costs	$	7,474,036.00	7,474,036.00	7,474,036.00	7,474,036.00									
Critical Maintenance	$	**368,651,662.79**	**368,651,662.79**	**32,309,026.00**	**32,309,026.00**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
Ontario Place Site														
Exhibits and Programs	$	-	-	2,412,500	2,412,500									
Marketing and Advertising	$	-	-	2,283,100	2,283,100									
Visitor Services	$	-	-	3,361,700	3,361,700									
Facility Operations	$	-	-	5,423,500	5,423,500									
Program Management	$	-	-	3,652,500	3,652,500									
Administration	$	-	-	4,188,800	4,188,800									
Capital Projects	$	-	-	-	-									
General Operations	$	**$ -**	**-**	**21,322,100**	**21,322,100**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
Occupancy Costs	$	-	-	2,205,600	2,205,600									
OMNIMAX Theatre	$	-	-	1,324,600	1,324,600									
International Sales and Rentals	$	-	-	-	-									
Educational Programs and Admission	$	-	-	1,987,500	1,987,500									
Recreation & Family Learning Experiences	$	-	-	781,600	781,600									
Memberships	$	-	-	587,300	587,300									
Concessions	$	-	-	100,500	100,500									
Interest	$	-	-	6,667	6,667									
Adult & Corporate Learning Experiences	$	-	-	368,800	368,800									
Sponsorship/Donations	$	-	-	1,348,900	1,348,900									
Program Support and Other Expenses	$	-	-	265,300	265,300									
Bank and Service Fees	$	-	-	152,000	152,000									
Expenses from Ancillary Operations	$	**-**	**-**	**6,923,166.67**	**6,923,166.67**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
Severance Costs	$	-	-	7,212,121	7,212,121									
Severance Costs	$	**-**	**-**	**7,212,121.21**	**7,212,121.21**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
Ontario Place Common Areas Maintenance	$	-	-	313,277.70	313,277.70									

Lifecycle Costs	$	-	-	5,589,766	5,589,766										
Critical Maintenance	$	**-**	**-**	**313,277.70**	**313,277.70**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Ontario
Infrastructure Ontario

					0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Model Year					2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072
Calendar Year							2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072
Fiscal Year					2021-04-01	2022-04-01	FY2023/2024	FY2024/2025	FY2025/2026	FY2026/2027	FY2027/2028	FY2028/2029	FY2029/2030	FY2030/2031	FY2031/2032	FY2032/2033	FY2033/2034	FY2034/2035	FY2035/2036	FY2036/2037	FY2037/2038	FY2038/2039	FY2039/2040	FY2040/2041	FY2041/2042	FY2042/2043	FY2043/2044	FY2044/2045	FY2045/2046	FY2046/2047	FY2047/2048	FY2048/2049	FY2049/2050	FY2050/2051	FY2051/2052	FY2052/2053	FY2053/2054	FY2054/2055	FY2055/2056	FY2056/2057	FY2057/2058	FY2058/2059	FY2059/2060	FY2060/2061	FY2061/2062	FY2062/2063	FY2063/2064	FY2064/2065	FY2065/2066	FY2066/2067	FY2067/2068	FY2068/2069	FY2069/2070	FY2070/2071	FY2071/2072	FY2072/2073
Year Start					2021-04-01	2022-04-01	2023-04-01	2024-04-01	2025-04-01	2026-04-01	2027-04-01	2028-04-01	2029-04-01	2030-04-01	2031-04-01	2032-04-01	2033-04-01	2034-04-01	2035-04-01	2036-04-01	2037-04-01	2038-04-01	2039-04-01	2040-04-01	2041-04-01	2042-04-01	2043-04-01	2044-04-01	2045-04-01	2046-04-01	2047-04-01	2048-04-01	2049-04-01	2050-04-01	2051-04-01	2052-04-01	2053-04-01	2054-04-01	2055-04-01	2056-04-01	2057-04-01	2058-04-01	2059-04-01	2060-04-01	2061-04-01	2062-04-01	2063-04-01	2064-04-01	2065-04-01	2066-04-01	2067-04-01	2068-04-01	2069-04-01	2070-04-01	2071-04-01	2072-04-01	2073-04-01
Year End					2022-03-31	2023-03-31	2024-03-31	2025-03-31	2026-03-31	2027-03-31	2028-03-31	2029-03-31	2030-03-31	2031-03-31	2032-03-31	2033-03-31	2034-03-31	2035-03-31	2036-03-31	2037-03-31	2038-03-31	2039-03-31	2040-03-31	2041-03-31	2042-03-31	2043-03-31	2044-03-31	2045-03-31	2046-03-31	2047-03-31	2048-03-31	2049-03-31	2050-03-31	2051-03-31	2052-03-31	2053-03-31	2054-03-31	2055-03-31	2056-03-31	2057-03-31	2058-03-31	2059-03-31	2060-03-31	2061-03-31	2062-03-31	2063-03-31	2064-03-31	2065-03-31	2066-03-31	2067-03-31	2068-03-31	2069-03-31	2070-03-31	2071-03-31	2072-03-31	2073-03-31
Construction Year							0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Operating Year Remain							1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Operating Year Relocate							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction Flag							FALSE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Operating - General							TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Remain Location Flag							TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Relocation Location Flag							FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE

ONTARIO SCIENCE CENTRE	UNIT	NPV	TOTAL																																																								
Inflation & Growth																																																									
General Inflation	%				1.00	1.02	1.04	1.06	1.08	1.10	1.13	1.15	1.17	1.20	1.22	1.24	1.27	1.29	1.32	1.35	1.37	1.40	1.43	1.46	1.49	1.52	1.55	1.58	1.61	1.64	1.67	1.71	1.74	1.78	1.81	1.85	1.88	1.92	1.96	2.00	2.04	2.08	2.12	2.16	2.21	2.25	2.30	2.34	2.39	2.44	2.49	2.54	2.59	2.64
Revenue Growth Rate	%				1.00	1.02	1.03	1.05	1.06	1.08	1.09	1.11	1.13	1.14	1.16	1.18	1.20	1.21	1.23	1.25	1.27	1.29	1.31	1.33	1.35	1.37	1.39	1.41	1.43	1.45	1.47	1.49	1.52	1.54	1.56	1.59	1.61	1.63	1.66	1.68	1.71	1.73	1.76	1.79	1.81	1.84	1.87	1.90	1.93	1.95	1.98	2.01	2.04	2.07
FTE Total	#				250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250
FTE Growth (Cumulative)	%				100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
FTE Wage Growth	%				100%	101.00%	102.01%	103.03%	104.06%	105.10%	106.15%	107.21%	108.29%	109.37%	110.46%	111.57%	112.68%	113.81%	114.95%	116.10%	117.26%	118.43%	119.61%	120.81%	122.02%	123.24%	124.47%	125.72%	126.97%	128.24%	129.53%	130.82%	132.13%	133.45%	134.78%	136.13%	137.49%	138.87%	140.26%	141.66%	143.08%	144.51%	145.95%	147.41%	148.89%	150.38%	151.88%	153.40%	154.93%	156.48%	158.05%	159.63%	161.22%	162.83%
Visitor Growth Rate	%				87%	87%	0%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Spending Curves & Visitors																																																									
Building Construction Spend Curve	%		0%		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Critical Maintenance - Ontario Science Centre	%		100%		11.81%	12.76%	7.05%	3.98%	8.86%	3.79%	6.88%	0.35%	7.21%	3.72%	7.13%	7.92%	0.35%	3.35%	2.01%	1.51%	8.87%	0.92%	1.05%	0.46%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Exhibition Construction/Minor Repairs	%		100%		0.00%	0.00%	33.33%	33.33%	33.33%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Remain Visitors	#		43,127,974		766,487	766,487	-	885,000	885,000	885,000	885,000	885,000	885,000	885,000	885,000	885,000	885,000	885,000	885,000	885,000	885,000	885,000	885,000	885,000	885,000	885,000	885,000	885,000	885,000	885,000	885,000	885,000	885,000	885,000	885,000	885,000	885,000	885,000	885,000	885,000	885,000	885,000	885,000	885,000	885,000	885,000	885,000	885,000	885,000	885,000	885,000	885,000	885,000
Relocate Visitors																																																										
REVENUE																																																									
Remain																																																									
General Admission (includes Parking Fees)	$	213,343,708	448,411,250		5,365,409	5,445,890	-	6,477,978	6,575,147	6,673,774	6,773,881	6,875,489	6,978,622	7,083,301	7,189,550	7,297,394	7,406,855	7,517,957	7,630,727	7,745,188	7,861,366	7,979,286	8,098,975	8,220,460	8,343,767	8,468,923	8,595,957	8,724,896	8,855,770	8,988,606	9,123,436	9,260,287	9,399,191	9,540,179	9,683,282	9,828,531	9,975,959	10,125,599	10,277,483	10,431,645	10,588,119	10,746,941	10,908,145	11,071,768	11,237,844	11,406,412	11,577,508	11,751,170	11,927,438	12,106,350	12,287,945	12,472,264	12,659,348	12,849,238
Parking Fees	$				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Revenue from Ancillary Operations																																																									
OMNIMAX Theatre	$	47,617,489	100,083,604		1,197,539	1,215,502	-	1,449,859	1,467,547	1,489,561	1,511,904	1,534,583	1,557,601	1,580,965	1,604,680	1,628,750	1,653,181	1,677,979	1,703,149	1,728,696	1,754,626	1,780,946	1,807,660	1,834,775	1,862,296	1,890,231	1,918,584	1,947,363	1,976,574	2,006,222	2,036,315	2,066,860	2,097,863	2,129,331	2,161,271	2,193,690	2,226,595	2,259,994	2,293,894	2,328,303	2,363,227	2,398,676	2,434,656	2,471,176	2,508,243	2,545,867	2,584,055	2,622,816	2,662,158	2,702,090	2,742,622	2,783,761	2,825,517	2,867,900
International Sales and Rentals	$	67,865,154	144,960,083		1,489,323	1,519,110	1,771,575	1,824,853	1,861,350	1,898,577	1,936,549	1,975,280	2,014,785	2,055,081	2,096,183	2,138,106	2,180,869	2,224,486	2,268,976	2,314,355	2,360,642	2,407,855	2,456,012	2,505,132	2,555,235	2,606,340	2,658,467	2,711,636	2,765,869	2,821,186	2,877,610	2,935,162	2,993,865	3,053,743	3,114,817	3,177,114	3,240,656	3,305,469	3,371,579	3,439,010	3,507,790	3,577,946	3,649,505	3,722,495	3,796,945	3,872,884	3,950,342	4,029,348	4,109,935	4,192,134	4,275,977	4,361,496	4,448,726	4,537,701
Educational Programs and Admission	$	42,774,899	89,905,374		1,075,752	1,091,888	-	1,298,819	1,318,301	1,338,076	1,358,147	1,378,519	1,399,197	1,420,185	1,441,488	1,463,110	1,485,056	1,507,332	1,529,942	1,552,891	1,576,185	1,599,828	1,623,825	1,648,182	1,672,905	1,697,999	1,723,469	1,749,321	1,775,561	1,802,194	1,829,227	1,856,665	1,884,515	1,912,783	1,941,475	1,970,597	2,000,156	2,030,158	2,060,610	2,091,520	2,122,892	2,154,736	2,187,057	2,219,863	2,253,161	2,286,958	2,321,262	2,356,081	2,391,423	2,427,294	2,463,703	2,500,659	2,538,169	2,576,241
Recreation & Familly Learning Experiences	$	34,926,904	71,596,424		856,679	869,528	-	1,034,318	1,049,833	1,065,581	1,081,564	1,097,788	1,114,255	1,130,969	1,147,933	1,165,152	1,182,629	1,200,369	1,218,374	1,236,650	1,255,200	1,274,028	1,293,138	1,312,535	1,332,223	1,352,207	1,372,490	1,393,077	1,413,973	1,435,183	1,456,710	1,478,561	1,500,740	1,523,251	1,546,099	1,569,291	1,592,830	1,616,723	1,640,974	1,665,588	1,690,572	1,715,931	1,741,670	1,767,795	1,794,311	1,821,226	1,848,545	1,876,273	1,904,417	1,932,983	1,961,978	1,991,407	2,021,279	2,051,598
Memberships	$	73,249,728	153,958,148		1,842,167	1,869,800	-	2,224,158	2,257,520	2,291,383	2,325,754	2,360,640	2,396,050	2,431,990	2,468,470	2,505,497	2,543,080	2,581,226	2,619,944	2,659,244	2,699,132	2,739,619	2,780,714	2,822,424	2,864,761	2,907,732	2,951,348	2,995,618	3,040,552	3,086,161	3,132,453	3,179,440	3,227,132	3,275,539	3,324,672	3,374,542	3,425,160	3,476,537	3,528,685	3,581,616	3,635,340	3,689,870	3,745,218	3,801,396	3,858,417	3,916,293	3,975,038	4,034,663	4,095,183	4,156,611	4,218,960	4,282,245	4,346,478	4,411,675
Concessions	$	15,855,277	33,325,027		398,746	404,728	-	481,430	488,652	495,982	503,421	510,973	518,637	526,417	534,313	542,328	550,463	558,720	567,100	575,607	584,241	593,005	601,900	610,928	620,092	629,393	638,834	648,417	658,143	668,015	678,035	688,206	698,529	709,007	719,642	730,437	741,393	752,514	763,802	775,259	786,888	798,691	810,672	822,832	835,174	847,702	860,417	873,323	886,423	899,720	913,215	926,914	940,817	954,930
Adult & Corporate Learning Experiences	$	18,765,252	39,441,578		471,937	479,016	-	569,750	578,137	587,012	595,877	604,754	613,826	623,033	632,379	641,864	651,492	661,265	671,184	681,251	691,470	701,842	712,370	723,055	733,901	744,910	756,083	767,425	778,936	790,620	802,479	814,517	826,734	839,135	851,722	864,498	877,466	890,628	903,987	917,547	931,310	945,280	959,459	973,851	988,459	1,003,286	1,018,335	1,033,610	1,049,114	1,064,851	1,080,823	1,097,036	1,113,491	1,130,194
Sponsorship/Donations	$	101,174,174	216,108,204		2,220,301	2,264,707	2,641,085	2,720,513	2,774,923	2,830,422	2,887,030	2,944,771	3,003,666	3,063,739	3,125,014	3,187,514	3,251,265	3,316,290	3,382,616	3,450,268	3,519,273	3,589,659	3,661,452	3,734,681	3,809,375	3,885,562	3,963,273	4,042,539	4,123,390	4,205,858	4,289,975	4,375,774	4,463,290	4,552,555	4,643,607	4,736,479	4,831,208	4,927,832	5,026,389	5,126,917	5,229,455	5,334,044	5,440,725	5,549,540	5,660,530	5,773,741	5,889,216	6,007,000	6,127,140	6,249,683	6,374,677	6,502,170	6,632,214	6,764,858
Program Support and Other Revenue	$	4,180,779	8,787,268		105,143	106,720	-	126,945	128,850	130,782	132,744	134,735	136,756	138,808	140,890	143,003	145,148	147,325	149,535	151,778	154,055	156,366	158,711	161,092	163,508	165,961	168,450	170,977	173,542	176,145	178,787	181,469	184,191	186,954	189,758	192,604	195,493	198,426	201,402	204,423	207,490	210,602	213,761	216,967	220,222	223,525	226,878	230,281	233,735	237,241	240,800	244,412	248,078	251,799
Interest Income	$	6,956,486	14,621,319		174,950	177,574	-	211,227	214,395	217,611	220,876	224,189	227,552	230,965	234,429	237,946	241,515	245,138	248,815	252,547	256,335	260,180	264,083	268,044	272,065	276,146	280,288	284,492	288,760	293,091	297,487	301,950	306,479	311,076	315,742	320,478	325,286	330,165	335,117	340,144	345,246	350,425	355,681	361,016	366,432	371,928	377,507	383,170	388,917	394,751	400,672	406,682	412,783	418,974
Interim Revenue Impact	$				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Remain Revenue		625,846,911	1,321,198,121		15,197,938	15,444,455	4,412,660	18,415,891	18,714,856	19,018,761	19,327,687	19,641,720	19,960,946	20,285,453	20,615,329	20,950,665	21,291,553	21,638,087	21,990,362	22,348,475	22,712,525	23,082,613	23,458,840	23,841,309	24,230,128	24,625,403	25,027,244	25,435,761	25,851,068	26,273,281	26,702,515	27,138,891	27,582,529	28,033,553	28,492,087	28,958,261	29,432,203	29,914,045	30,403,922	30,901,971	31,408,330	31,923,141	32,446,548	32,978,698	33,519,738	34,069,822	34,629,102	35,197,737	35,775,884	36,363,708	36,961,373	37,569,046	38,186,901	38,815,109
Relocate																																																										
General Admission (includes Parking Fees)	$				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Parking Fees	$				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Revenue from Ancillary Operations																																																								
OMNIMAX Theatre	$				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
International Sales and Rentals	$				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Educational Programs and Admission	$				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Recreation & Familly Learning Experiences	$				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Memberships	$				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Concessions	$				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Adult & Corporate Learning Experiences	$				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sponsorship/Donations	$				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Program Support and Other Revenue	$				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Interest Income	$				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Relocate Revenue					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL REVENUE		**625,846,911**	**1,321,198,121**	-	**15,197,938**	**15,444,455**	**4,412,660**	**18,415,891**	**18,714,856**	**19,018,761**	**19,327,687**	**19,641,720**	**19,960,946**	**20,285,453**	**20,615,329**	**20,950,665**	**21,291,553**	**21,638,087**	**21,990,362**	**22,348,475**	**22,712,525**	**23,082,613**	**23,458,840**	**23,841,309**	**24,230,128**	**24,625,403**	**25,027,244**	**25,435,761**	**25,851,068**	**26,273,281**	**26,702,515**	**27,138,891**	**27,582,529**	**28,033,553**	**28,492,087**	**28,958,261**	**29,432,203**	**29,914,045**	**30,403,922**	**30,901,971**	**31,408,330**	**31,923,141**	**32,446,548**	**32,978,698**	**33,519,738**	**34,069,822**	**34,629,102**	**35,197,737**	**35,775,884**	**36,363,708**	**36,961,373**	**37,569,046**	**38,186,901**	**38,815,109**
EXPENSES																																																									
Capital Expenses																																																									
Construction Expenditure																																																									
Construction - Building	$				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction - Exhibits	$	(64,578,670)	(70,579,557)		-	-	(23,062,200)	(23,523,444)	(23,993,913)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Buildings Critical Maintenance	$	(306,089,768)	(368,651,660)		(43,522,357)	(47,037,571)	(26,002,191)	(14,689,494)	(32,647,293)	(13,956,095)	(25,362,803)	(1,301,909)	(26,577,489)	(13,710,960)	(26,300,244)	(29,201,129)	(1,276,421)	(12,361,362)	(7,404,281)	(5,564,852)	(32,684,174)	(3,387,378)	(3,887,243)	(1,776,416)																																							
Minor Repairs	$	(41,369,193)	(45,213,570)		-	-	(14,777,680)	(15,069,154)	(15,370,537)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Decommissioning and decant costs	$				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Moving Costs	$				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trailing Obligations - Rent & IO Mgt Fee	$				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trailing Obligations - Operations	$				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Capital Expenses		(412,037,631)	(484,444,590)		(43,522,357)	(47,

Ontario
Infrastructure Ontario

Scenarios to Compare	
Comparison 1	Comparison 2
0	1

NOTE: To be updated by Ministry.

Fiscal Year						FY2023/2024	FY2024/2025	FY2025/2026	FY2026/2027	FY2027/2028	FY2028/2029	FY2029/2030	FY2030/2031	FY2031/2032	FY2032/2033	FY2033/2034	FY2034/2035	FY2035/2036	FY2036/2037	FY2037/2038	FY2038/2039	FY2039/2040	FY2040/2041	FY2041/2042	FY2042/2043	FY2043/2044	FY2044/2045	FY2045/2046	FY2046/2047	FY2047/2048	FY2048/2049	FY2049/2050	FY2050/2051	FY2051/2052	FY2052/2053	FY2053/2054	FY2054/2055	FY2055/2056	FY2056/2057	FY2057/2058	FY2058/2059	FY2059/2060	FY2060/2061	FY2061/2062	FY2062/2063	FY2063/2064	FY2064/2065	FY2065/2066	FY2066/2067	FY2067/2068	FY2068/2069	FY2069/2070	FY2070/2071	FY2071/2072	FY2072/2073
Construction Year				0	0	0	0	1	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Operating Year Remain						1	2	0	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49
Operating Year Relocate				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Remain on Site	UNIT	NPV	TOTAL																																																				
OPERATING COSTS																																																							
Current Location	$	(1,474,345,183)	(3,156,724,738)			(41,380,969)	(41,995,367)	(34,912,500)	(44,470,357)	(45,140,082)	(45,821,005)	(46,513,328)	(47,217,256)	(47,932,999)	(48,660,771)	(49,400,790)	(50,153,277)	(50,918,459)	(51,696,565)	(52,487,831)	(53,292,496)	(54,110,803)	(54,943,000)	(55,789,342)	(56,650,085)	(57,525,492)	(58,415,832)	(59,321,377)	(60,242,405)	(61,179,199)	(62,132,049)	(63,101,249)	(64,087,098)	(65,089,902)	(66,109,973)	(67,147,629)	(68,203,192)	(69,276,992)	(70,369,365)	(71,480,655)	(72,611,209)	(73,761,384)	(74,931,541)	(76,122,052)	(77,333,291)	(78,565,643)	(79,819,499)	(81,095,257)	(82,393,324)	(83,714,114)	(85,058,050)	(86,425,560)	(87,817,084)	(89,233,069)	(90,673,970)
Relocate Location	$	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Operating Costs	**$**	**(1,474,345,183)**	**(3,156,724,738)**	**-**	**-**	**(41,380,969)**	**(41,995,367)**	**(34,912,500)**	**(44,470,357)**	**(45,140,082)**	**(45,821,005)**	**(46,513,328)**	**(47,217,256)**	**(47,932,999)**	**(48,660,771)**	**(49,400,790)**	**(50,153,277)**	**(50,918,459)**	**(51,696,565)**	**(52,487,831)**	**(53,292,496)**	**(54,110,803)**	**(54,943,000)**	**(55,789,342)**	**(56,650,085)**	**(57,525,492)**	**(58,415,832)**	**(59,321,377)**	**(60,242,405)**	**(61,179,199)**	**(62,132,049)**	**(63,101,249)**	**(64,087,098)**	**(65,089,902)**	**(66,109,973)**	**(67,147,629)**	**(68,203,192)**	**(69,276,992)**	**(70,369,365)**	**(71,480,655)**	**(72,611,209)**	**(73,761,384)**	**(74,931,541)**	**(76,122,052)**	**(77,333,291)**	**(78,565,643)**	**(79,819,499)**	**(81,095,257)**	**(82,393,324)**	**(83,714,114)**	**(85,058,050)**	**(86,425,560)**	**(87,817,084)**	**(89,233,069)**	**(90,673,970)**
CAPITAL COSTS																																																							
Critical Maintenance	$	(297,218,181)	(368,651,663)			(43,522,357)	(47,037,571)	(26,002,191)	(14,689,494)	(32,647,293)	(13,956,095)	(25,362,803)	(1,301,909)	(26,577,489)	(13,710,960)	(26,300,244)	(29,201,129)	(1,276,421)	(12,361,362)	(7,404,281)	(5,564,852)	(32,684,174)	(3,387,378)	(3,887,243)	(1,776,416)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Relocate Expenses	$	(23,213,873)	(45,213,370)			-	-	-	-	(1,130,334)	(1,130,334)	(1,130,334)	(1,130,334)	(1,130,334)	(1,130,334)	(1,130,334)	(1,130,334)	(1,130,334)	(1,130,334)	(1,130,334)	(1,130,334)	(1,130,334)	(1,130,334)	(1,130,334)	(1,130,334)	(1,130,334)	(1,130,334)	(1,130,334)	(1,130,334)	(1,130,334)	(1,130,334)	(1,130,334)	(1,130,334)	(1,130,334)	(1,130,334)	(1,130,334)	(1,130,334)	(1,130,334)	(1,130,334)	(1,130,334)	(1,130,334)	(1,130,334)	(1,130,334)	(1,130,334)	(1,130,334)	(1,130,334)	(1,130,334)	(1,130,334)	(1,130,334)	-	-	-	-	-	-
Statutory Capital Expense (Exhibits)	$	(46,647,595)	(70,579,557)			-	-	-	-	(3,528,978)	(3,528,978)	(3,528,978)	(3,528,978)	(3,528,978)	(3,528,978)	(3,528,978)	(3,528,978)	(3,528,978)	(3,528,978)	(3,528,978)	(3,528,978)	(3,528,978)	(3,528,978)	(3,528,978)	(3,528,978)	(3,528,978)	(3,528,978)	(3,528,978)	(3,528,978)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Statutory Capital Expense (New Build)	$	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Capital Costs	**$**	**(367,079,649)**	**(484,444,590)**	**-**	**-**	**(43,522,357)**	**(47,037,571)**	**(26,002,191)**	**(14,689,494)**	**(37,306,605)**	**(18,615,408)**	**(30,022,115)**	**(5,961,221)**	**(31,236,801)**	**(18,370,272)**	**(30,959,556)**	**(33,860,441)**	**(5,935,733)**	**(17,020,674)**	**(12,063,593)**	**(10,224,164)**	**(37,343,486)**	**(8,046,690)**	**(8,546,555)**	**(6,435,728)**	**(4,659,312)**	**(4,659,312)**	**(4,659,312)**	**(4,659,312)**	**(1,130,334)**	**(1,130,334)**	**(1,130,334)**	**(1,130,334)**	**(1,130,334)**	**(1,130,334)**	**(1,130,334)**	**(1,130,334)**	**(1,130,334)**	**(1,130,334)**	**(1,130,334)**	**(1,130,334)**	**(1,130,334)**	**(1,130,334)**	**(1,130,334)**	**(1,130,334)**	**(1,130,334)**	**(1,130,334)**	**(1,130,334)**	**(1,130,334)**	**-**	**-**	**-**	**-**	**-**	**-**
FISCAL IMPACT - Remain on Site	**$**	**(1,841,424,832)**	**(3,641,169,328)**	**-**	**-**	**(84,903,326)**	**(89,032,938)**	**(60,914,690)**	**(59,159,850)**	**(82,446,687)**	**(64,436,412)**	**(76,535,443)**	**(53,178,477)**	**(79,169,800)**	**(67,031,044)**	**(80,360,346)**	**(84,013,718)**	**(56,854,192)**	**(68,717,239)**	**(64,551,424)**	**(63,516,659)**	**(91,454,289)**	**(62,989,691)**	**(64,335,897)**	**(63,085,813)**	**(62,184,804)**	**(63,075,144)**	**(63,980,689)**	**(64,901,717)**	**(62,309,534)**	**(63,262,384)**	**(64,231,583)**	**(65,217,432)**	**(66,220,237)**	**(67,240,308)**	**(68,277,963)**	**(69,333,526)**	**(70,407,326)**	**(71,499,700)**	**(72,610,989)**	**(73,741,543)**	**(74,891,718)**	**(76,061,876)**	**(77,252,386)**	**(78,463,625)**	**(79,695,977)**	**(80,949,833)**	**(82,225,591)**	**(83,523,658)**	**(83,714,114)**	**(85,058,050)**	**(86,425,560)**	**(87,817,084)**	**(89,233,069)**	**(90,673,970)**
Revenue Adjustment																																																							
Current Location	$	607,911,056	1,321,198,121			15,197,938	15,444,455	4,412,660	18,415,891	18,714,856	19,018,761	19,327,687	19,641,720	19,960,946	20,285,453	20,615,329	20,950,665	21,291,553	21,638,087	21,990,362	22,348,475	22,712,525	23,082,613	23,458,840	23,841,309	24,230,128	24,625,403	25,027,244	25,435,761	25,851,068	26,273,281	26,702,515	27,138,891	27,582,529	28,033,553	28,492,087	28,958,261	29,432,203	29,914,045	30,403,922	30,901,971	31,408,330	31,923,141	32,446,548	32,978,698	33,519,738	34,069,822	34,629,102	35,197,737	35,775,884	36,363,708	36,961,373	37,569,046	38,186,901	38,815,109
Relocate Location	$	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Revenue	**$**	**607,911,056**	**1,321,198,121**	**-**	**-**	**15,197,938**	**15,444,455**	**4,412,660**	**18,415,891**	**18,714,856**	**19,018,761**	**19,327,687**	**19,641,720**	**19,960,946**	**20,285,453**	**20,615,329**	**20,950,665**	**21,291,553**	**21,638,087**	**21,990,362**	**22,348,475**	**22,712,525**	**23,082,613**	**23,458,840**	**23,841,309**	**24,230,128**	**24,625,403**	**25,027,244**	**25,435,761**	**25,851,068**	**26,273,281**	**26,702,515**	**27,138,891**	**27,582,529**	**28,033,553**	**28,492,087**	**28,958,261**	**29,432,203**	**29,914,045**	**30,403,922**	**30,901,971**	**31,408,330**	**31,923,141**	**32,446,548**	**32,978,698**	**33,519,738**	**34,069,822**	**34,629,102**	**35,197,737**	**35,775,884**	**36,363,708**	**36,961,373**	**37,569,046**	**38,186,901**	**38,815,109**
NET IMPACT - Remain on Site	**$**	**(1,233,513,776)**	**(2,319,971,207)**	**-**	**-**	**(69,705,388)**	**(73,588,483)**	**(56,502,031)**	**(40,743,959)**	**(63,731,831)**	**(45,417,652)**	**(57,207,756)**	**(33,536,757)**	**(59,208,854)**	**(46,745,591)**	**(59,745,018)**	**(63,063,054)**	**(35,562,639)**	**(47,079,153)**	**(42,561,063)**	**(41,168,184)**	**(68,741,763)**	**(39,907,078)**	**(40,877,057)**	**(39,244,504)**	**(37,954,676)**	**(38,449,741)**	**(38,953,445)**	**(39,465,956)**	**(36,458,465)**	**(36,989,103)**	**(37,529,068)**	**(38,078,541)**	**(38,637,708)**	**(39,206,755)**	**(39,785,876)**	**(40,375,265)**	**(40,975,123)**	**(41,585,655)**	**(42,207,067)**	**(42,839,572)**	**(43,483,388)**	**(44,138,735)**	**(44,805,838)**	**(45,484,927)**	**(46,176,239)**	**(46,880,011)**	**(47,596,489)**	**(48,325,922)**	**(47,938,230)**	**(48,694,342)**	**(49,464,187)**	**(50,248,038)**	**(51,046,169)**	**(51,858,861)**
		Check:	TRUE																																																				
Remain on Site Subsidy Surplus/(Deficit)	**UNIT**	**NPV**	**TOTAL**																																																				
Net Impact	$	(1,233,513,776)	(2,319,971,207)			(69,705,388)	(73,588,483)	(56,502,031)	(40,743,959)	(63,731,831)	(45,417,652)	(57,207,756)	(33,536,757)	(59,208,854)	(46,745,591)	(59,745,018)	(63,063,054)	(35,562,639)	(47,079,153)	(42,561,063)	(41,168,184)	(68,741,763)	(39,907,078)	(40,877,057)	(39,244,504)	(37,954,676)	(38,449,741)	(38,953,445)	(39,465,956)	(36,458,465)	(36,989,103)	(37,529,068)	(38,078,541)	(38,637,708)	(39,206,755)	(39,785,876)	(40,375,265)	(40,975,123)	(41,585,655)	(42,207,067)	(42,839,572)	(43,483,388)	(44,138,735)	(44,805,838)	(45,484,927)	(46,176,239)	(46,880,011)	(47,596,489)	(48,325,922)	(47,938,230)	(48,694,342)	(49,464,187)	(50,248,038)	(51,046,169)	(51,858,861)
Less: Current OSC Subsidy	$	499,157,422	970,000,000			19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000
Surplus/(Deficit)	**$**	**(734,356,354)**	**(1,349,971,207)**			**(50,305,388)**	**(54,188,483)**	**(37,102,031)**	**(21,343,959)**	**(44,331,831)**	**(26,017,652)**	**(37,807,756)**	**(14,136,757)**	**(39,808,854)**	**(27,345,591)**	**(40,345,018)**	**(43,663,054)**	**(16,162,639)**	**(27,679,153)**	**(23,161,063)**	**(21,768,184)**	**(49,341,763)**	**(20,507,078)**	**(21,477,057)**	**(19,844,504)**	**(18,554,676)**	**(19,049,741)**	**(19,553,445)**	**(20,065,956)**	**(17,058,465)**	**(17,589,103)**	**(18,129,068)**	**(18,678,541)**	**(19,237,708)**	**(19,806,755)**	**(20,385,876)**	**(20,975,265)**	**(21,575,123)**	**(22,185,655)**	**(22,807,067)**	**(23,439,572)**	**(24,083,388)**	**(24,738,735)**	**(25,405,838)**	**(26,084,927)**	**(26,776,239)**	**(27,480,011)**	**(28,196,489)**	**(28,925,922)**	**(28,538,230)**	**(29,294,342)**	**(30,064,187)**	**(30,848,038)**	**(31,646,169)**	**(32,458,861)**

Fiscal Year						FY2023/2024	FY2024/2025	FY2025/2026	FY2026/2027	FY2027/2028	FY2028/2029	FY2029/2030	FY2030/2031	FY2031/2032	FY2032/2033	FY2033/2034	FY2034/2035	FY2035/2036	FY2036/2037	FY2037/2038	FY2038/2039	FY2039/2040	FY2040/2041	FY2041/2042	FY2042/2043	FY2043/2044	FY2044/2045	FY2045/2046	FY2046/2047	FY2047/2048	FY2048/2049	FY2049/2050	FY2050/2051	FY2051/2052	FY2052/2053	FY2053/2054	FY2054/2055	FY2055/2056	FY2056/2057	FY2057/2058	FY2058/2059	FY2059/2060	FY2060/2061	FY2061/2062	FY2062/2063	FY2063/2064	FY2064/2065	FY2065/2066	FY2066/2067	FY2067/2068	FY2068/2069	FY2069/2070	FY2070/2071	FY2071/2072	FY2072/2073
Construction Year				0	0	0	0	1	2	3	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Operating Year Remain						1	2	3	4	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Operating Year Relocate				0	0	0	0	0	0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Relocation	UNIT	NPV	TOTAL																																																				
OPERATING COSTS																																																							
Current Location	$	(174,883,885)	(190,974,946)			(46,426,403)	(33,163,710)	(33,811,631)	(34,470,357)	(35,140,082)	(7,962,765)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Relocate Location	$	(1,023,025,355)	(2,349,100,419)			-	-	-	-	-	(31,103,971)	(38,727,939)	(38,409,255)	(38,522,560)	(39,094,448)	(39,675,788)	(40,266,749)	(40,867,503)	(41,478,228)	(42,099,100)	(42,730,303)	(43,372,022)	(44,024,446)	(44,687,769)	(45,362,187)	(46,047,900)	(46,745,112)	(47,454,030)	(48,174,867)	(48,907,838)	(49,653,164)	(50,411,067)	(51,181,777)	(51,965,527)	(52,762,552)	(53,573,095)	(54,397,402)	(55,235,723)	(56,088,315)	(56,955,437)	(57,837,355)	(58,734,339)	(59,646,666)	(60,574,616)	(61,518,474)	(62,478,534)	(63,455,091)	(64,448,450)	(65,458,919)	(66,486,811)	(67,532,449)	(68,596,159)	(69,678,273)	(70,779,131)	(71,899,080)
Total Operating Costs	**$**	**(1,197,909,240)**	**(2,540,075,365)**	**-**	**-**	**(46,426,403)**	**(33,163,710)**	**(33,811,631)**	**(34,470,357)**	**(35,140,082)**	**(39,066,736)**	**(38,727,939)**	**(38,409,255)**	**(38,522,560)**	**(39,094,448)**	**(39,675,788)**	**(40,266,749)**	**(40,867,503)**	**(41,478,228)**	**(42,099,100)**	**(42,730,303)**	**(43,372,022)**	**(44,024,446)**	**(44,687,769)**	**(45,362,187)**	**(46,047,900)**	**(46,745,112)**	**(47,454,030)**	**(48,174,867)**	**(48,907,838)**	**(49,653,164)**	**(50,411,067)**	**(51,181,777)**	**(51,965,527)**	**(52,762,552)**	**(53,573,095)**	**(54,397,402)**	**(55,235,723)**	**(56,088,315)**	**(56,955,437)**	**(57,837,355)**	**(58,734,339)**	**(59,646,666)**	**(60,574,616)**	**(61,518,474)**	**(62,478,534)**	**(63,455,091)**	**(64,448,450)**	**(65,458,919)**	**(66,486,811)**	**(67,532,449)**	**(68,596,159)**	**(69,678,273)**	**(70,779,131)**	**(71,899,080)**
CAPITAL COSTS																																																							
Critical Maintenance	$	(29,641,817)	(32,309,026)			(412,786)	(13,200,621)	(9,711,236)	(6,222,902)	(2,761,481)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Relocate Expenses	$	(18,632,078)	(37,378,150)			-	-	-	-	-	(934,454)	(934,454)	(934,454)	(934,454)	(934,454)	(934,454)	(934,454)	(934,454)	(934,454)	(934,454)	(934,454)	(934,454)	(934,454)	(934,454)	(934,454)	(934,454)	(934,454)	(934,454)	(934,454)	(934,454)	(934,454)	(934,454)	(934,454)	(934,454)	(934,454)	(934,454)	(934,454)	(934,454)	(934,454)	(934,454)	(934,454)	(934,454)	(934,454)	(934,454)	(934,454)	(934,454)	(934,454)	(934,454)	(934,454)	(934,454)	-	-	-	-	-
Statutory Capital Expense (Exhibits)	$	(46,190,479)	(71,984,561)			-	-	-	-	-	(3,599,228)	(3,599,228)	(3,599,228)	(3,599,228)	(3,599,228)	(3,599,228)	(3,599,228)	(3,599,228)	(3,599,228)	(3,599,228)	(3,599,228)	(3,599,228)	(3,599,228)	(3,599,228)	(3,599,228)	(3,599,228)	(3,599,228)	(3,599,228)	(3,599,228)	(3,599,228)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Statutory Capital Expense (New Build)	$	(160,086,796)	(321,153,023)			-	-	-	-	-	(8,028,826)	(8,028,826)	(8,028,826)	(8,028,826)	(8,028,826)	(8,028,826)	(8,028,826)	(8,028,826)	(8,028,826)	(8,028,826)	(8,028,826)	(8,028,826)	(8,028,826)	(8,028,826)	(8,028,826)	(8,028,826)	(8,028,826)	(8,028,826)	(8,028,826)	(8,028,826)	(8,028,826)	(8,028,826)	(8,028,826)	(8,028,826)	(8,028,826)	(8,028,826)	(8,028,826)	(8,028,826)	(8,028,826)	(8,028,826)	(8,028,826)	(8,028,826)	(8,028,826)	(8,028,826)	(8,028,826)	(8,028,826)	(8,028,826)	(8,028,826)	(8,028,826)	(8,028,826)	-	-	-	-	-
Total Capital Costs	**$**	**(254,551,170)**	**(462,824,760)**	**-**	**-**	**(412,786)**	**(13,200,621)**	**(9,711,236)**	**(6,222,902)**	**(2,761,481)**	**(12,562,507)**	**(12,562,507)**	**(12,562,507)**	**(12,562,507)**	**(12,562,507)**	**(12,562,507)**	**(12,562,507)**	**(12,562,507)**	**(12,562,507)**	**(12,562,507)**	**(12,562,507)**	**(12,562,507)**	**(12,562,507)**	**(12,562,507)**	**(12,562,507)**	**(12,562,507)**	**(12,562,507)**	**(12,562,507)**	**(12,562,507)**	**(12,562,507)**	**(8,963,279)**	**(8,963,279)**	**(8,963,279)**	**(8,963,279)**	**(8,963,279)**	**(8,963,279)**	**(8,963,279)**	**(8,963,279)**	**(8,963,279)**	**(8,963,279)**	**(8,963,279)**	**(8,963,279)**	**(8,963,279)**	**(8,963,279)**	**(8,963,279)**	**(8,963,279)**	**(8,963,279)**	**(8,963,279)**	**(8,963,279)**	**(8,963,279)**	**-**	**-**	**-**	**-**	**-**
FISCAL IMPACT - Remain on Site	**$**	**(1,452,460,410)**	**(3,002,900,125)**	**-**	**-**	**(46,839,189)**	**(46,364,331)**	**(43,522,867)**	**(40,693,259)**	**(37,901,563)**	**(51,629,243)**	**(51,290,446)**	**(50,971,762)**	**(51,085,067)**	**(51,656,955)**	**(52,238,295)**	**(52,829,256)**	**(53,430,011)**	**(54,040,735)**	**(54,661,607)**	**(55,292,810)**	**(55,934,529)**	**(56,586,954)**	**(57,250,277)**	**(57,924,695)**	**(58,610,407)**	**(59,307,619)**	**(60,016,537)**	**(60,737,374)**	**(61,470,346)**	**(58,616,443)**	**(59,374,347)**	**(60,145,057)**	**(60,928,806)**	**(61,725,831)**	**(62,536,374)**	**(63,360,681)**	**(64,199,002)**	**(65,051,594)**	**(65,918,716)**	**(66,800,634)**	**(67,697,619)**	**(68,609,945)**	**(69,537,895)**	**(70,481,754)**	**(71,441,813)**	**(72,418,371)**	**(73,411,729)**	**(74,422,198)**	**(75,450,091)**	**(67,532,449)**	**(68,596,159)**	**(69,678,273)**	**(70,779,131)**	**(71,899,080)**
Revenue Adjustment																																																							
Current Location	$	57,673,559	62,632,802			17,547,819	10,832,452	11,121,783	11,415,891	11,714,856	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Relocate Location	$	527,833,073	1,216,749,711			-	-	-	-	-	6,422,406	22,489,659	20,842,047	20,147,312	20,449,522	20,756,265	21,067,609	21,383,623	21,704,377	22,029,943	22,360,392	22,695,798	23,036,235	23,381,778	23,732,505	24,088,492	24,449,820	24,816,567	25,188,816	25,566,648	25,950,148	26,339,400	26,734,491	27,135,508	27,542,541	27,955,679	28,375,014	28,800,639	29,232,649	29,671,139	30,116,206	30,567,949	31,026,468	31,491,865	31,964,243	32,443,707	32,930,362	33,424,318	33,925,682	34,434,568	34,951,086	35,475,352	36,007,483	36,547,595	37,095,809
Total Revenue	**$**	**585,506,632**	**1,279,382,513**	**-**	**-**	**17,547,819**	**10,832,452**	**11,121,783**	**11,415,891**	**11,714,856**	**6,422,406**	**22,489,659**	**20,842,047**	**20,147,312**	**20,449,522**	**20,756,265**	**21,067,609**	**21,383,623**	**21,704,377**	**22,029,943**	**22,360,392**	**22,695,798**	**23,036,235**	**23,381,778**	**23,732,505**	**24,088,492**	**24,449,820**	**24,816,567**	**25,188,816**	**25,566,648**	**25,950,148**	**26,339,400**	**26,734,491**	**27,135,508**	**27,542,541**	**27,955,679**	**28,375,014**	**28,800,639**	**29,232,649**	**29,671,139**	**30,116,206**	**30,567,949**	**31,026,468**	**31,491,865**	**31,964,243**	**32,443,707**	**32,930,362**	**33,424,318**	**33,925,682**	**34,434,568**	**34,951,086**	**35,475,352**	**36,007,483**	**36,547,595**	**37,095,809**
NET IMPACT - Remain on Site	**$**	**(866,953,778)**	**(1,723,517,612)**	**-**	**-**	**(29,291,370)**	**(35,531,879)**	**(32,401,083)**	**(29,277,367)**	**(26,186,707)**	**(45,206,838)**	**(28,800,788)**	**(30,129,715)**	**(30,937,755)**	**(31,207,433)**	**(31,482,030)**	**(31,761,647)**	**(32,046,388)**	**(32,336,358)**	**(32,631,665)**	**(32,932,418)**	**(33,238,731)**	**(33,550,719)**	**(33,868,499)**	**(34,192,190)**	**(34,521,915)**	**(34,857,799)**	**(35,199,970)**	**(35,548,559)**	**(35,903,698)**	**(32,666,295)**	**(33,034,947)**	**(33,410,566)**	**(33,793,298)**	**(34,183,291)**	**(34,580,695)**	**(34,985,667)**	**(35,398,363)**	**(35,818,945)**	**(36,247,577)**	**(36,684,428)**	**(37,129,670)**	**(37,583,477)**	**(38,046,030)**	**(38,517,511)**	**(38,998,106)**	**(39,488,009)**	**(39,987,412)**	**(40,496,515)**	**(41,015,523)**	**(32,581,363)**	**(33,120,806)**	**(33,670,790)**	**(34,231,536)**	**(34,803,271)**
		Check:	TRUE																																																				
Relocation Subsidy Surplus/(Deficit)	**UNIT**	**NPV**	**TOTAL**																																																				
Net Impact	$	(866,953,778)	(1,723,517,612)			(29,291,370)	(35,531,879)	(32,401,083)	(29,277,367)	(26,186,707)	(45,206,838)	(28,800,788)	(30,129,715)	(30,937,755)	(31,207,433)	(31,482,030)	(31,761,647)	(32,046,388)	(32,336,358)	(32,631,665)	(32,932,418)	(33,238,731)	(33,550,719)	(33,868,499)	(34,192,190)	(34,521,915)	(34,857,799)	(35,199,970)	(35,548,559)	(35,903,698)	(32,666,295)	(33,034,947)	(33,410,566)	(33,793,298)	(34,183,291)	(34,580,695)	(34,985,667)	(35,398,363)	(35,818,945)	(36,247,577)	(36,684,428)	(37,129,670)	(37,583,477)	(38,046,030)	(38,517,511)	(38,998,106)	(39,488,009)	(39,987,412)	(40,496,515)	(41,015,523)	(32,581,363)	(33,120,806)	(33,670,790)	(34,231,536)	(34,803,271)
Less: Current OSC Subsidy	$	499,157,422	970,000,000			19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000	19,400,000
Surplus/(Deficit)	**$**	**(367,796,356)**	**(753,517,612)**			**(9,891,370)**	**(16,131,879)**	**(13,001,083)**	**(9,877,367)**	**(6,786,707)**	**(25,806,838)**	**(9,400,788)**	**(10,729,715)**	**(11,537,755)**	**(11,807,433)**	**(12,082,030)**	**(12,361,647)**	**(12,646,388)**	**(12,936,358)**	**(13,231,665)**	**(13,532,418)**	**(13,838,731)**	**(14,150,719)**	**(14,468,499)**	**(14,792,190)**	**(15,121,915)**	**(15,457,799)**	**(15,799,970)**	**(16,148,559)**	**(16,503,698)**	**(13,266,295)**	**(13,634,947)**	**(14,010,566)**	**(14,393,298)**	**(14,783,291)**	**(15,180,695)**	**(15,585,667)**	**(15,998,363)**	**(16,418,945)**	**(16,847,577)**	**(17,284,428)**	**(17,729,670)**	**(18,183,477)**	**(18,646,030)**	**(19,117,511)**	**(19,598,106)**	**(20,088,009)**	**(20,587,412)**	**(21,096,515)**	**(21,615,523)**	**(13,181,363)**	**(13,720,806)**	**(14,270,790)**	**(14,831,536)**	**(15,403,271)**
FISCAL IMPACT DELTA	**$**		**638,269,203**			**38,064,137**	**42,668,607**	**17,391,824**	**18,466,592**	**44,545,124**	**12,807,169**	**25,244,997**	**2,206,715**	**28,084,733**	**15,374,089**	**28,122,052**	**31,184,462**	**3,424,181**	**14,676,504**	**9,889,817**	**8,223,849**	**35,519,760**	**6,402,737**	**7,085,620**	**5,161,119**	**3,574,397**	**3,767,525**	**3,964,152**	**4,164,343**	**839,188**	**4,645,941**	**4,857,236**	**5,072,375**	**5,291,431**	**5,514,476**	**5,741,589**	**5,972,845**	**6,208,324**	**6,448,106**	**6,692,273**	**6,940,909**	**7,194,099**	**7,451,930**	**7,714,491**	**7,981,871**	**8,254,164**	**8,531,462**	**8,813,862**	**9,101,461**	**8,264,024**	**17,525,601**	**17,829,402**	**18,138,811**	**18,453,938**	**18,774,890**
NET IMPACT DELTA	**$**		**596,453,594**			**40,414,018**	**38,056,604**	**24,100,947**	**11,466,592**	**37,545,124**	**210,814**	**28,406,968**	**3,407,042**	**28,271,099**	**15,538,158**	**28,262,988**	**31,301,407**	**3,516,251**	**14,742,795**	**9,929,398**	**8,235,766**	**35,503,032**	**6,356,359**	**7,008,559**	**5,052,314**	**3,432,761**	**3,591,942**	**3,753,475**	**3,917,397**	**554,768**	**4,322,807**	**4,494,121**	**4,667,976**	**4,844,410**	**5,023,465**	**5,205,180**	**5,389,598**	**5,576,760**	**5,766,710**	**5,959,489**	**6,155,144**	**6,353,718**	**6,555,257**	**6,759,808**	**6,967,417**	**7,178,132**	**7,392,003**	**7,609,077**	**7,829,407**	**6,922,707**	**16,112,979**	**16,343,381**	**16,577,248**	**16,814,632**	**17,055,590**

OPTIONS SUMMARY SHEET

IN NPV TERMS							
Key Metrics	**Impact of Relocate**	**Remain on Site**	**Relocation**				
Remain Revenue	(566,446,535)	625,846,911	59,400,376				
Relocate Revenue	543,378,180	-	543,378,180				
Total Revenue	**(23,068,355)**	**625,846,911**	**602,778,556**				
Remain Operating Expense	1,084,228,468	(1,220,830,654)	(136,602,186)				
Relocate Operating Expense	(847,505,970)	-	(847,505,970)				
Total Operating Expense	**236,722,497**	**(1,220,830,654)**	**(984,108,157)**				
Common Areas Maintenance	(10,914,042)	-	(10,914,042)				
Lifecycle Maintenance	65,644,650	(297,031,408)	(231,386,757)				
Total Maintenance	**54,730,608**	**(297,031,408)**	**(242,300,799)**				
Severance Costs	(6,867,638)	-	(6,867,638)				
Severance Costs	**(6,867,638)**	**-**	**(6,867,638)**				
Buildings Critical Maintenance	275,561,136	(306,089,768)	(30,528,632)				
Total Critical Maintenance	**275,561,136**	**(306,089,768)**	**(30,528,632)**				
OSC Construction Cost - Exhibits	41,998,103	(105,947,863)	(63,949,759)				
OSC Construction Cost - Buildings	(290,028,437)	-	(290,028,437)				
OSC Other Capital Expenses	(32,124,675)	-	(32,124,675)				
Total Capital Expenses	**(280,155,008)**	**(105,947,863)**	**(386,102,871)**				
Combined EBITDA	**$ 256,923,241**	**$ (1,304,052,782)**	**$ (1,047,129,541)**				
Check:		TRUE	TRUE				

IN NOMINAL TERMS							
Key Metrics	**Impact of Relocate**	**Remain on Site**	**Relocation**				
Remain Revenue	(1,258,565,319)	1,321,198,121	62,632,802				
Relocate Revenue	1,216,749,711	-	1,216,749,711				
Total Revenue	**(41,815,608)**	**1,321,198,121**	**1,279,382,513**				
Remain Operating Expense	2,380,458,248	(2,524,575,246)	(144,116,998)				
Relocate Operating Expense	(1,880,544,218)	-	(1,880,544,218)				
Total Operating Expense	**499,914,030**	**(2,524,575,246)**	**(2,024,661,217)**				
Common Areas Maintenance	(24,866,530)	-	(24,866,530)				
Lifecycle Maintenance	149,564,637	(632,149,491)	(482,584,854)				
Total Maintenance	**124,698,107**	**(632,149,491)**	**(507,451,384)**				
Severance Costs	(7,962,765)	-	(7,962,765)				
Severance Costs	**(7,962,765)**	**-**	**(7,962,765)**				
Buildings Critical Maintenance	336,342,637	(368,651,663)	(32,309,026)				
Total Critical Maintenance	**336,342,637**	**(368,651,663)**	**(32,309,026)**				
OSC Construction Cost - Exhibits	43,808,366	(115,792,927)	(71,984,561)				
OSC Construction Cost - Buildings	(321,153,023)	-	(321,153,023)				
OSC Other Capital Expenses	(37,378,150)	-	(37,378,150)				
Total Capital Expenses	**(314,722,807)**	**(115,792,927)**	**(430,515,734)**				
Combined EBITDA	**$ 596,453,594**	**$ (2,319,971,207)**	**$ (1,723,517,612)**				
Check:		TRUE	TRUE				

Memo

Summary of Key Cost Pressure Factors

(OSC - 40% BCA Escalation Justification)

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Infrastructure Ontario

SUBJECT: Summary of Key Cost Pressure Factors
As of December 31, 2022

FROM: Infrastructure Ontario Project Controls

DATE: March 3, 2023

The following are contributors to the 40% cost escalation to estimates provided by Pinchin in their April 2022 Building Condition Assessment report.

Supply-Chain Pressures

- Internationally, supply chain pressures appear to be softening but remain significantly tighter than pre-covid levels. The Global Supply Chain Pressure Index, which was trending down at the end of last quarter, continued to decline in the third quarter, reaching the lowest level since November 2020. The index is down 74% from the record high last December but it remains well above levels seen before the pandemic. The Index's year-to-date movements suggest that global supply chain pressures are beginning to fall back in line with historic levels.

- Domestically, the supply chain remains constrained but is showing signs of easing in some areas. In August 2022, the risk of greater delays increased for five of the six categories of building products for which there are data. The IVEY Purchasing Managers Index shows that, in Canada, more purchasing managers reported a slowing down of deliveries in the third quarter of 2022 than reported improvements. Truck loads have normalized in line with pre-covid levels through an influx of capacity amid softening freight demand. In September, there were 3.65 trucks for every load, which is approximately 38% higher than the ratio seen in September 2021. Land shipping costs saw the first indication of easing in the third quarter; however, domestic rail costs remain elevated near their highest level since 2018. Trucking costs continued to increase into June (the most recent data). The truck transportation index increased by 11.7% in the second quarter of 2022 compared to the previous quarter (2022- Q1) and 27.8% higher compared to the second quarter of 2021.

Opportunity Pricing:

- Contractor capacity remains very limited and opportunity bidding or passing on bidding continues to be a risk going forward. In the second quarter of 2022 (latest data published), the construction industry was operating at 94% of its production capacity – this figure is slightly below the peak observed last quarter but is in line with levels observed in 2021 and significantly higher than the pre-covid rate. In 2022 (Q2), contractors' prices for non-residential building construction were 14.7% higher in Ottawa-Gatineau and 17.3% higher in Toronto compared to 2021 (Q2).

Interest Rates:

- The increase in both short-term and long-term financing is likely a product of the Bank of Canada's recent steep interest rate hikes. The new rates will significantly raise the interest payments on the science facility's already increased project costs, and risk tolerance among lenders will likely drop for the foreseeable future. Interest rates also impact machinery and equipment leasing rates, further increasing the cost of design & construction.

Construction Costs:

- Due to a combination of the factors detailed above, the overall cost of construction materials has increased significantly. In the third quarter of 2022, the Construction Materials Price Index continued to decline from the peak levels observed in March. Despite the softening of prices observed in Q3, the composite index in September 2022 was 11.5% higher than in September 2021 and remains 43.2% higher than it was in September 2019 (i.e., pre-Covid).

- Ready-mix concrete prices continued to climb in the third quarter. Concrete has experienced significant price inflation over the past year due to a combination of increased demand, labour shortages and issues at major plants.

- The price of rebar steel in the U.S market continued to decline in the third quarter. Spot prices for rebar were 27% lower in September relative to the recent peak in April.

- Quarry and pit prices for sand and gravel continued to rise to record levels in the third quarter, increasing by 2.5% from the second quarter.

- Softwood lumber prices in September were nearly 50% lower than the peak observed in March of 2022. Prices in September were nonetheless higher than those before the onset of the pandemic.

- Steel prices dropped notably in the third quarter which can partially be attributed to slowing demand in China stemming from a softening property market. Prices in the fourth quarter will be dependent on global supply and the ability of manufacturers to access needed scrap metal.

- In the second quarter of 2022, the composite indicator of seven categories of building supplies was 17% higher than in the second quarter of 2021. In June 2022, the composite indicator declined for the first time since January.

Labour supply and costs

- The current state of the construction labour market supply is relatively positive. Labour supply continued to expand in the third quarter and reached a record level in July 2022. On average, labour supply in the third quarter of 2022 was 5.8% higher than in the third quarter of 2019 and 8.4% higher than in the third quarter of 2021. There has been a notable return of workers nearing retirement age (55 and older) to the workforce in 2022, surpassing 2019

levels. This recovery will benefit the increased demand for skilled workers over the near-term but poses challenges for the industry over the long-term.

Appendix J

Fiscal and Economic Impact Analysis

Confidential and Privileged Advice to Government

Ontario Science Centre Relocation Business Case

Economic Impact Assessment

Final Report

8 March 2023

Building a better working world

Table of Contents

Executive Summary

The Ontario Science Centre (OSC) is one of Ontario's most significant cultural attractions where people of all ages can enjoy and learn about science, technology, and innovation. Established in 1969 at the Don Valley Parkway in Toronto, the OSC is currently facing operational challenges that may impact its long-term sustainability. Ernst & Young LLP (EY) has been engaged by Infrastructure Ontario (IO) to provide financial and economic advisory services and undertake an economic impact and fiscal impact assessment of the two primary options for a renewed OSC. These options are:

- **Option 1** (Remain on Site)**:** address all capital repairs/deferred maintenance issues and undertake refresh of public areas and exhibits at the current 770 Don Mills site. No consolidation or rationalization of space / programming is contemplated under this option.
- **Option 2** (Relocate)**:** construct a new, smaller OSC facility as cultural anchor on provincially-owned land with new exhibits and modernized program. The smaller sized facility must be of a scale to allow OSC to successfully deliver its current mandate.

Economic impact assessment results

The total economic impacts of construction, operations, and tourism spending over a 50-year appraisal period are presented in Table 1, including the total incremental differences between the Remain on Site and Relocate options on an inflation adjusted (real) basis. This holistic assessment allows for a comparison of the economic impacts of the two options and showcases the potential economic effects of the project over the appraisal period.

Table 1: Total Economic Impacts

	Remain on Site	Relocate	Incremental Impact
Results for 2023-2073			
GDP impacts ($m, real 2023)	2,438.6	2,032.1	**-406.5**
Jobs impacts (Full-time equivalents (FTE), annual)			
Construction	323	888	**565**
Operations	391	336	**-55**
Tourism	18	20	**2**
Tax impacts ($m, real 2023)	312.2	260.2	**-52.0**

In total, the Remain on Site option provides an additional **$407 million** of GDP, **55 FTEs** annually during operations, and **$52 million** in tax revenue over the 50-year period from 2023 to 2073. The higher economic impacts for the Remain on Site option are driven by higher staffing costs, higher maintenance costs, and higher occupancy costs.

Additional economic impacts of relocating the OSC

The potential relocation of OSC to Ontario Place will generate additional economic impacts beyond the GDP, employment, and tax impacts described above. These additional impacts include:

- **Land value uplift and tax gain:** The relocation of the OSC to Ontario Place provides the Government of Ontario and the City of Toronto with an opportunity to facilitate residential and commercial development at the Don Mills location. Developing the existing OSC lands will lead to an increase in tax revenue for the City of Toronto through the sale of development lands and recurring property tax revenue. Based on land valuation and property tax revenue estimates, the present value of future tax revenue accruing to the City of Toronto over a 50-year period would range between **$601 million to $785 million**.
- **Synergies with surrounding infrastructure and developments:** The relocation of the OSC to Ontario Place will complement various infrastructure investments and developments in Toronto, including:
  - *Residential developments:* The Greater Toronto Area (GTA) housing market ranks last of all major Canadian cities in key affordability metrics such as mortgage repayments as a percentage of income, with a median price condominium requiring approximately 54.8% of an individual median income in Toronto.[1] Relocating the OSC to Ontario Place would enable OSC land at Don Mills to be redeveloped into mixed-use residential and commercial space and provide approximately 2,500 to 3,000 new dwellings.
  - *Transport infrastructure:* The proposed Ontario Line is a 15.6-kilometre rapid transit line connecting the current OSC location with Ontario Place. By relocating the OSC to Ontario Place and increasing housing supply at the Don Mills location, ridership for the Ontario Line may increase as more residents will be located in close proximity to the Ontario Line, and the new OSC location will be more accessible at a central downtown location for residents and tourists. Improved access to the OSC may also drive an increase in visitation and revenue growth, which will improve the financial sustainability of the OSC.
  - *Ontario Place precinct:* The Ontario Place precinct includes 155 acres of pristine waterfront property near downtown Toronto. The clustering of entertainment and cultural offerings at Ontario Place may facilitate increased visitation to OSC by increasing the appeal and ease for visitors to visit multiple attractions in one location. The new location may also drive increased visitation and tourism due to the close proximity to the heavily populated downtown Toronto area with many restaurants, retail outlets, hotels, and other tourist and recreational offerings.

[1] National Bank of Canada, Housing Affordability Monitor Q3 2022. Accessed at https://www.nbc.ca/content/dam/bnc/taux-analyses/analyse-eco/logement/housing-affordability.pdf

- **Increased tourism:** The relocation of the OSC to Ontario Place may also benefit the City of Toronto and the GTA by driving increased tourism, which would likely result in a series of broader economic impacts. In 2018, Toronto had almost 28 million visitors, with 10 million of those staying overnight.[2] In total, visitors to the city spent just under $7 billion during their time there. This expenditure from tourist visitation has large economic impacts for the city and the province, which may be further enhanced by a new OSC at Ontario Place.
- **Staffing:** Labour costs are the largest cost item for the OSC, comprising of 60% of total operating costs in 2018/19 prior to any operational impacts from the COVID-19 pandemic. A newly designed OSC at Ontario Place may allow to reduce staffing levels from 250 to 215 FTEs due to a smaller, more efficient building layout and operational changes. Additionally, reduced staffing levels for Option 2 will meet the staffing cap set by the Ministry of Tourism, Culture, and Sport (MCTS).

Fiscal impact assessment results

Fiscal impact refers to the net impact on Government resources for a particular project or program. To provide a holistic analysis of each project option, it is important to consider the fiscal impacts and draw on public resources. EY has undertaken a fiscal impact analysis derived from the financial results of each project option, and with consideration to public sector accounting guidance.

Table 2 summarizes the 50-year fiscal impact on a nominal and real basis for each project option.

Table 2: 50-year fiscal impact ($m)

Real	Remain on Site	Relocate
Operating costs	$(1,858.2)	$(1,504.4)
Deferred maintenance	$(318.3)	$(30.5)
Capital costs	$(81.9)	$(275.4)
Revenues	$770.4	$743.7
Fiscal Impact	$(1,487.9)	$(1,066.6)
Net fiscal impact compared to option 1	-	**$421.3**
Nominal	Remain on Site	Relocate
Operating costs	$(3,156.7)	$(2,540.1)
Deferred maintenance	$(368.7)	$(32.3)
Capital costs	$(115.8)	$(430.5)
Revenues	$1,321.2	$1,279.4
Fiscal Impact	$(2,320.0)	$(1,723.5)
Net fiscal impact compared to option 1	-	**$596.5**

[2] Destination Toronto, Visitor Economic Study. Accessed at https://www.destinationtoronto.com/research/business-intelligence/visitor-economy-study/

The results above show that the Relocate option would provide fiscal savings to the Government of Ontario over the 50-year appraisal period of **$421 million** in real 2023 dollars, and **$597 million** in nominal terms relative to the Remain on Site option. The fiscal improvement over the 50-year appraisal period for the Relocate option reflects lower staffing requirements, lower maintenance costs, lower occupancy costs, and increased revenue as a result of higher visitation assumptions and a $0.50 increase in average admission per visitor.

Assuming the Government of Ontario would reinvest these fiscal savings in other areas such as infrastructure, health, and education, the fiscal savings could generate an additional **$409 million** in GDP and **$47.4 million** in tax revenue over the 50-year period.

1. Project Overview and Background

1.1. Ontario Science Centre relocation

The Ontario Science Centre (OSC) is one of Ontario's most significant cultural attractions where people of all ages can enjoy and learn about science, technology, and innovation. Established in 1969 at the Don Valley Parkway in Toronto, the OSC remains one of Ontario's most recognized brands. However, the OSC is currently facing operational challenges that may impact its long-term sustainability. As a result, the Government of Ontario is investigating options to modernize the OSC and solidify its position as a world-class science centre whilst ensuring long-term financial stability (the project).

Ernst & Young LLP (EY) has been engaged by Infrastructure Ontario to provide financial and economic advisory services and undertake an economic impact and fiscal impact assessment of the two primary options for a renewed OSC. These options are:

- **Option 1** (Remain on Site)**:** address all capital repairs/deferred maintenance issues and undertake refresh of public areas and exhibits at the current 770 Don Mills site. No consolidation or rationalization of space / programming is contemplated under this option.
- **Option 2** (Relocate)**:** construct a new, smaller OSC facility as cultural anchor on provincially-owned land with new exhibits and modernized program. The smaller sized facility must be of a scale to allow OSC to successfully deliver its current mandate.

The economic impact assessment analyzes how the OSC's expected capital expenditures (CAPEX), operating expenditures (OPEX), and tourist spending impacts the provincial economy as it relates to gross domestic product (GDP), job creation, labour income, and tax contribution. The fiscal impact assessment analyzes the budgetary impact of each OSC option by estimating the impact of Government costs offset by OSC revenues.

The remaining sections of this chapter outline CAPEX, OPEX, and tourism visitation assumptions for each project option, and are used as inputs to the economic impact and fiscal impact assessment. These assumptions are based on information provided from IO, OSC, Lord Cultural Resources, and other external advisers.

1.2. Capital costs

Capital costs are expenses that are incurred to develop each option. For the Remain on Site option, capital costs reflect construction costs for new exhibits and cosmetic upgrades, and for the Relocate option capital costs reflect the construction costs associated with building a new OSC at Ontario Place, including investments in new exhibits. Table 3 displays the total capital costs associated with each project option.

Table 3: Capital cost of each project option

Project option	Option components	Construction timeframe	Real CAPEX ($m)
Option 1: Remain on Site	OSC remains at its current location	2025 – 2028	$109.1
Option 2: Relocate	OSC relocates to Ontario Place	2025 – 2029	$400.2

It is noted that the capital costs in Table 3 are preliminary and subject to change as the project options are refined. Capital costs for the Remain on Site option consist of $66.5 million in construction of new exhibits, and $42.6 million in minor repairs. Capital costs for the Relocate option consist of $300 million in building construction, $66.5 million in construction of new exhibits, $20.9 million in decommissioning and decant costs, $4.9 million in moving costs, as well as $8 million in other trailing obligations.

1.3. Operational costs

Operating costs estimates are the expenses incurred every year the OSC is operational, and include costs related to labour (i.e., salaries and wages), and purchases of goods and services necessary for OSC operations (e.g., utilities, office maintenance, etc.). The following categories of operating expenses were assessed for each option:

- **Salaries, wages and benefits:** In 2021/22, the OSC employed approximately 250 FTEs, with total salaries, wages and benefits of $20.5 million. However, labour costs in 2020/21, and 2021/22 were negatively impacted by forced closures during the COVID-19 pandemic. To determine a more realistic estimate of salaries wages and benefits for the economic analysis, labour costs were averaged over a ten-year period from 2010/11 to 2019/20 and extrapolated to 2023/24 to provide a more accurate estimate of labour costs under a business-as-usual scenario.
- **FTEs:** Although not a direct operating cost item, FTE staffing assumptions for each option has a significant impact on labour costs. For Option 2, given a much smaller footprint, changes to operations and a more efficient building layout, staffing levels may be reduced from 250 to 215 FTEs reducing salaries, wages, and benefits by approximately 14% (or $2.5 million annually). It is noted that FTE requirements for Option 2 are subject to new functional requirements, operating hours, and other functionality considerations which may impact FTE requirements.
- **Occupancy costs:** Annual lease and related occupancy costs such as management fees and associated operating and maintenance costs. In 2021/22, OSC occupancy costs were $4.7 million. Given Option 2 is expected to have a significantly smaller footprint in terms of building square footage, occupancy costs are expected to be reduced by around $3.0 million per annum.
- **Other operating expenses:** This item includes all other operating expenses, which consist of general operations expenditures excluding salaries, wages and benefits, along with ancillary operations expenditures, and maintenance expenditures, which include lifecycle maintenance and deferred maintenance costs.

Table 4 displays the real annual and 50-year total OPEX associated with each project option, consisting of salaries, wages and benefits, along with occupancy costs and other operating expenses.

Table 4: Operational cost of each project option

Project option	Option components	Real OPEX ($m, p.a.[3])	Real OPEX ($m, 50-year total)
Option 1: Remain on Site	OSC remains at its current location	$44.4	$2,219.3
Option 2: Relocate	OSC relocates to Ontario Place	$31.2	$1,557.9

It is noted that the capital costs in Table 4 are preliminary and do not represent an OSC budget submission or business planning process. Therefore, operating costs for each project option are subject to change as the project progresses.

1.4. Tourism at OSC

The tourism economic impact of the OSC includes spending from visitors outside of the GTA to inject "new money" to the OSC. The "new money" is incremental to the local economy in that it would not have been spent in Toronto without the presence of OSC. Other spending at the OSC by local residents has therefore been excluded from the economic impact assessment as it is assumed local residents would have spent the money elsewhere in Toronto in the absence of the OSC.

The proportion of OSC visitors that are considered tourists was informed by visitor satisfaction surveys in 2020/21 and 2021/22, which found that approximately 21% of visitors were from outside the GTA. This finding was also consistent with pre-COVID-19 pandemic visitor surveys.

To calculate tourism expenditure at OSC, the tourism proportion of 21% was applied to daily visitation forecasts[4] for each project option to estimate average annual tourist visitation. These estimates were multiplied by general admission revenue per person assumptions from the financial analysis to calculate the total tourism expenditure for each option. Tourism expenditure for each option is shown in Table 5.

Table 5: Tourism expenditure estimates

Project option	Average annual visitation	Average annual tourism visitation	Total tourism expenditure ($m, real)
Option 1: Remain on Site	862,559	181,137	$56.2

[3] Represents the annual average across the 50-year appraisal period

[4] Provided by OSC's Visitor Satisfaction Survey average for the fiscal years 2016/2017, 2017/2018, and 2018/2019.

Project option	Average annual visitation	Average annual tourism visitation	Total tourism expenditure ($m, real)
Option 2: Relocate	979,167	205,625	$63.8

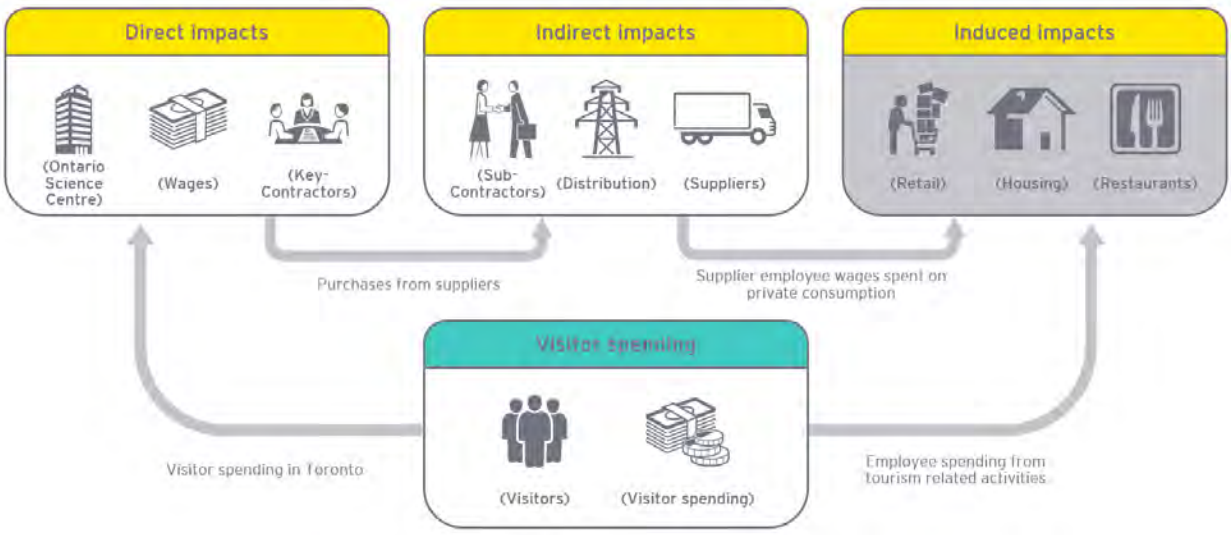
2. Assessing the Economic Impacts

To analyze the economic impact of the capital investment, operating expenditures, and tourism impacts associated with each option for the OSC, EY undertook a comprehensive EIA using detailed data from Statistics Canada, expenditure data described in Section 1, and combined it with EY's proprietary economic model tools (i.e., economic models founded on the principles of the Input-Output model described in Appendix A.2). As such, EY's analysis will capture the provincial economic impact of the OSC associated with each Project option.

2.1. Direct, indirect, and induced impacts

Using the framework of Input-Output model, EY captured the OSC's impacts on the Ontario economy via three distinct impacts as shown in Figure 1: Direct, indirect, and induced impacts of OSC activities. These impacts individually, and collectively, represent how the activities of the OSC ripple throughout the economy.

Figure 1: Direct, indirect, and induced impacts of OSC activities



More specifically, the impacts for each option are defined as follows:

- The *direct impact* includes the economic impact supported directly by OSC's capital investment, post-build/revitalization operation costs, and tourism spending at the OSC. These include, for example, spending on construction and renovations, cost directly linked to the day-to-day operations of the OSC, employee wages and benefits, and tourism expenditures at the OSC.

- The *indirect impact* includes the economic impact from the business activities arising from supporting the capital investment, operations, and tourism impact of the OSC. The indirect effect includes, for example, businesses providing security, catering, and cleaning services, in addition to businesses in the construction and supply industries, as well as a number of upstream suppliers in the Ontario economy.
- The *induced impact* includes the economic impact that occurs when employees and contractors of the OSC spend their wages in the Ontario economy. The induced activity is primarily service related in industries such as retail trade, transport, accommodation, restaurants, housing, and finance.
- The *visitor spending* is the primary input for tourism impacts in the analysis. In addition to operational and capital spending by the OSC, direct, indirect, and induced effects from additional expenditure by tourists are considered as part of the economic impact assessment.

2.2. Economic impact assessment methodology

A static interprovincial input-output (I-O) model has been used to assess the provincial economic impact of the OSC. This method was selected due to its flexibility in providing a reliable, cost-efficient way to assess regional impacts. In particular, the I-O model first translates direct impacts into indirect and induced economic impacts, which collectively defines the total economic impact for the Province of Ontario. Economic impacts are expressed in terms of the following metrics:

- *Gross Domestic Product*: GDP, or local value added, is a measure of the value of all final goods and services produced in a specific region (i.e., the Province of Ontario).
- *Labour income*: Labour income is a component of the local value-added that measures the total employee compensation (value of wages and benefits) and proprietor income.
- *Full-time equivalent employment*: The number of FTEs measures the number of employees on full-time schedules and the number of employees on part-time schedules converted to a full-time basis.
- *Taxes*: This includes personal tax, sales tax, and corporate tax estimation for the province.

The total economic impact of the OSC is estimated using Statistics Canada's most recent within province economic multipliers from 2018. Generally speaking, these multipliers reflect how Statistics Canada tracks the interdependency between all the sectors of the economy. Each of these multipliers is a number that describes the size of the total economic impacts for a given level of spending. For example, a multiplier of 1.2 suggests that the total economic impact for every dollar spent by OSC adds an *additional* 20 cents to the economy. In other words, for every dollar spent, the economic activity from supporting businesses and consumers generate an additional 20 cents in the local economy. Statistics Canada's I-O multipliers are used by both public and private sector organizations and other researchers and are based on widely accepted methodology for estimating these types of economic linkages. Please refer to Appendix A.2 for a detailed description of the I-O model and its underlying assumptions.

3. Economic Impact Assessment Results

This section presents the results from our economic impact assessment based on CAPEX, OPEX, and tourism expenditure estimates of each project option for the OSC. The economic impacts related to GDP, labour income, employment and taxes are presented separately below.

To assess the economic impact of each project option, EY used I-O economic multipliers to estimate GDP creation, job creation, and estimated tax revenues for the Province of Ontario. The calculations are based on a number of assumptions, including:

- Construction: Based on capital costs required for the relocated development and/or redevelopment of the OSC. These impacts are considered a "one-off" and only take place during the construction period.
- Operations: Based on ongoing operating costs for the Remain on Site and Relocate options of the OSC. These impacts are considered ongoing and take place each year the OSC is operational.
- Annual ongoing economic impact is based on annual spending from operations and annual spending from tourism.

An **incremental impact** was also calculated comparing the economic impacts of the Relocate and Remain on Site project options, and shows the difference in terms of GDP impact, job creation, and tax revenues.

All results from the economic impact assessment are presented in real, 2023 Canadian dollars, meaning that they have been expressed in terms of their purchasing power in the year 2023.

3.1. Total economic impacts

The total economic impacts of construction, operations, and tourism spending over the 50-year appraisal period are presented in Table 6, including the total incremental differences between the Remain on Site and Relocate options. This holistic assessment allows for a comparison of the economic impacts of the two options and showcases the potential economic effects of the project over the appraisal period.

Table 6: Total Economic Impacts

	Remain on Site	Relocate	**Incremental Impact**
Results for 2023-2073			
GDP impacts ($m, real 2023)	2,438.6	2,032.1	**-406.5**
Jobs impacts (FTE, annual)			
Construction	323	888	**565**
Operations	391	336	**-55**
Tourism	18	20	**2**
Tax impacts ($m, real 2023)	312.2	260.2	**-52**

3.1.1. Total economic impacts

- The Remain on Site option provides **$2,439 million** of GDP, while the Relocate option provides **$2,032 million**. This implies that the Remain on Site option provides an additional **$407 million** in GDP impacts when compared to the Relocate option.
- For the economic impacts on employment, the Relocate option provides **888 FTEs** annually across the four-year construction period, while the Remain on Site option provides **323 FTEs** annually across a three-year construction period. During operations (includes tourism impacts), the Remain on Site option provides an additional **53 FTEs** annually compared to the Relocate option. However, this is driven by higher FTE requirements of the OSC at the current Don Mills site.
- For the economic impacts on taxes, the Remain on Site option provides **$312 million** in total tax revenue, while the Relocate option provides **$260 million**. This implies that the Remain on Site option provides an additional **$52 million** in tax revenue when compared to the Relocate option.

In total, the Remain on Site option provides an additional **$407 million** of GDP, **53 FTEs** annually during operations, and **$52 million** in tax revenue from over the 50-year period from 2023 to 2073. However, the higher economic impacts for the Remain on Site option are driven by higher staffing costs, higher maintenance costs, and higher occupancy costs.

3.2. GDP analysis

GDP is defined as a monetary measure of the value of goods and services produced and is a quantitative measure of economic activity. One of the main contributors to GDP is government spending, which EY have relied upon in this analysis. Government spending is reflected as economic production and thereby stimulates a multiplying effect. This multiplying effect assumes that with any new injection of spending, it leads to a multiplying increase to spend – i.e., increased government spending may trigger increased jobs, which may then increase household income and the propensity to spend on consumer goods and other items.

Table 7 shows an overview of the estimated economic impacts for GDP. The GDP impacts are calculated over a 50-year period from 2023 to 2073.

Table 7: GDP Impacts (in $m, real 2023)

	Remain on Site	Relocate	Incremental Impact
Number of years of construction	3	4	
Results for 2023-2073			
GDP from construction	104.7	384.1	279.4
GDP from operations	2,277.9	1,584.5	-693.5
GDP from tourism	50.6	63.6	7.2
Total	**2,438.6**	**2,032.1**	**-406.5**
Estimated annual results during operations			
GDP from operations	45.6	31.7	-13.9
GDP from tourism	1.1	1.3	0.2
Total	**46.7**	**33.0**	**-13.7**

Table 7 contains two sections. The first represents the GDP generated by OSC over the 50-year period. Both of these options have continued operational and tourism GDP contributions that could potentially go beyond 2073. The second aims to capture annual impacts over the years that the OSC is operational in each option.

In summary, the Remain on Site option will generate a greater GDP impact over the 50-year period compared to the Relocate option. The Relocate option has a lower GDP impact due to operational efficiencies that decrease annual GDP impacts from operations. However, higher CAPEX investment and tourism expenditure results in the Relocate option generating an additional **$287 million** of GDP from construction and tourism when compared to the Remain on Site option.

The total impact under each category (GDP from construction, GDP from operations, GDP from tourism) is based on the total spend over 50-years. Differences between the individual impacts from construction, operations and tourism are described below.

3.2.1. Capital expenditure impact

- The GDP impact for construction of the Remain on Site option is about **$105 million**, and the Relocate option is **$384 million**. This implies the construction spending from an OSC relocation would generate an additional **$279 million** in GDP over the respective construction periods.
- The GDP generation from revitalization or relocation is temporary in nature and will end when construction is complete. Given the construction requirements under the Relocate option, higher GDP impacts are evident throughout the construction period.
- In accordance with public sector accounting guidance, maintenance costs, including deferred maintenance costs, do not qualify for capitalization and are therefore classified as operating

expenditures.[5] Therefore, any economic contributions generated from deferred maintenance spending are allocated to the operations benefits.

3.2.2. Operating expenditure and tourism impacts

- GDP impact for operations is calculated based on operations spending of the OSC. The larger square footage of the existing OSC contributes to higher operating spend (e.g., occupancy costs, FTEs). As a result, the Remain on Site option will have a GDP impact of approximately **$694 million** more than the Relocate option. This result is driven by the Remain on Site option requiring an additional ~$1.9 million annually on lifecycle maintenance, ~$3.0 million on occupancy costs, and requires an additional 35 FTEs compared to the Relocate option. Additionally, the result is influenced by the average annual deferred maintenance expenditures of over $5 million for the Remain on Site option relative to the Relocate option.
- The GDP from tourism is based on tourism spending at the OSC, which is driven by the number of tourists visiting the site. The GDP impact from tourism is greater under the Relocate option by $**7 million** compared to the Remain on Site option. This result is driven by the forecast increase in tourists visiting the OSC under the Relocate option.

Employment analysisTable 8 provides an overview of the estimated economic impacts for employment. The employment impacts of construction are calculated based on a three-year construction period for each option. Operational and tourism employment impacts are calculated over the 50-year period from 2023 to 2073.

Table 8: Employment impacts

	Remain on Site	Relocate	Incremental Impact
Estimated annual results during construction			
Jobs from construction	323	888	**565**
Jobs from operations	391	336	**-55**
Jobs from tourism	18	20	**2**
Total	**732**	**1,245**	**513**

During construction, the Relocate option will generate a greater employment impact when compared to the Remain on Site option. The difference in employment is primarily driven by higher construction spending in the Relocate option which leads to higher labour demand. As such, the relocation option

[5] Government of Canada, Directive on Account Standards: GC 3150 Tangible Capital Assets. Accessed at https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=32518

generates an additional **565 FTEs** annually during construction. However, during operations employment impacts will be higher under the Remain on Site option due to higher FTE requirements.

Differences between the individual impacts from construction, operations and tourism are described below.

3.2.3. Capital expenditure impact

- The employment impact for construction in the Remain on Site option is about **323 FTEs** annually during the three-year construction period, while the Relocate option is **888 FTEs** during a four-year construction period. This implies the construction spending from an OSC relocation would generate an additional **565 FTEs** annually during the respective construction periods.
- The job creation from revitalization or relocation is temporary in nature and will end when construction is complete. Given the construction requirements under the Relocate option, higher employment impacts are evident throughout the construction period.

3.2.4. Operating expenditure and tourism impacts

- Operational jobs, which could be primarily permanent in nature, represent those necessary to maintain and operate the OSC. The Relocate option may provide an opportunity to reduce staffing levels from 250 to 215 FTEs due to a smaller and more efficient building layout, along with potential operational changes. Therefore, the employment impacts from operations are lower for the Relocate option.
- Tourism jobs represent those in the food and beverage industry, along with hotels, taxis and other similar jobs. As such, the jobs created from tourism is largely based on the tourism attendance. The Relocate option will create approximately **two more jobs** annually than the Remain on Site option.

3.3. Tax analysis

The CAPEX, OPEX, and tourism expenditure driven by the OSC leads to tax revenues for the Ontario Government. Such expenditures may lead to increased revenues and profits for businesses in the value chain, and these additional profits may be subject to corporate income tax. Increased OPEX, CAPEX, and tourism expenditure may also lead to increased job creation and wages, which may be subject to personal income tax. As employees earn more income, they may also be more likely to spend on taxable goods and services, leading to increased sales tax revenues.

Tax revenues from personal income taxes (personal taxes), corporate income taxes (corporate taxes), sales taxes, and other taxes have been estimated based on the GDP impact of CAPEX, OPEX, and tourism expenditure estimates for each project option. An estimated 13% share of Ontario Government tax

revenue to GDP[6] has been applied to GDP impacts of each project option to determine total tax revenues, and this share is allocated according to the percentage share of government tax revenue for each account (personal taxes, sales taxes, corporate taxes, other taxes).[7]

Table 9 shows an overview of the estimated economic impacts for tax revenues. The tax impacts are calculated on a 50-year period from 2023 to 2073.

Table 9: Tax Impacts (in $m, real 2023)

	Remain on Site	Relocate	Incremental Impact
Results for 2023-2073			
Personal taxes	115.9	96.5	-19.3
Sales taxes	83.3	69.4	-13.9
Corporate taxes	60.8	50.7	-10.1
Other taxes	52.3	43.6	-8.7
Total	312.2	260.2	-52.0
Estimated annual results			
Personal taxes	2.3	1.9	-0.4
Sales taxes	1.7	1.4	-0.3
Corporate taxes	1.2	1.0	-0.2
Other taxes	1.0	0.9	-0.2
Total	6.2	5.2	-1.0

3.3.1. Tax impacts

- The tax impact for the Remain on Site option is about **$312 million**, compared to the Relocate option which is around **$260 million** over the 50-year period. The results show the Remain on Site option would generate an additional **$52 million** in tax revenue over 50-years, however this is due to higher staffing costs, occupancy costs, and maintenance costs.

[6] Province of Ontario, 2022 Ontario Budget. Accessed at https://budget.ontario.ca/2022/pdf/2022-ontario-budget-en.pdf

[7] Ibid

3.4. Additional Economic Impacts of Relocating the OSC

The potential relocation of OSC to Ontario Place will generate additional economic impacts beyond the direct, indirect, and induced effects described above. These additional impacts are analyzed in this section, and include:

- Land value uplift and tax gain.
- Synergies with surrounding infrastructure and developments.
- Increased tourism.
- Productivity improvements.

3.4.1. Land value uplift and tax gain

The proposed relocation of the OSC to Ontario Place provides the Government of Ontario and the City of Toronto with an opportunity to facilitate residential and commercial development at the Don Mills location. The purpose of this section is to refresh the *2016 Real Estate Advice Report* findings provided to IO as part of the *2016 OSC Relocation Business Case* and provide an up-to-date estimate of the economic benefits that may accrue to the City of Toronto from allowing the OSC lands at Don Mills to be redeveloped.

The land value uplift and tax gains considered in this section include:

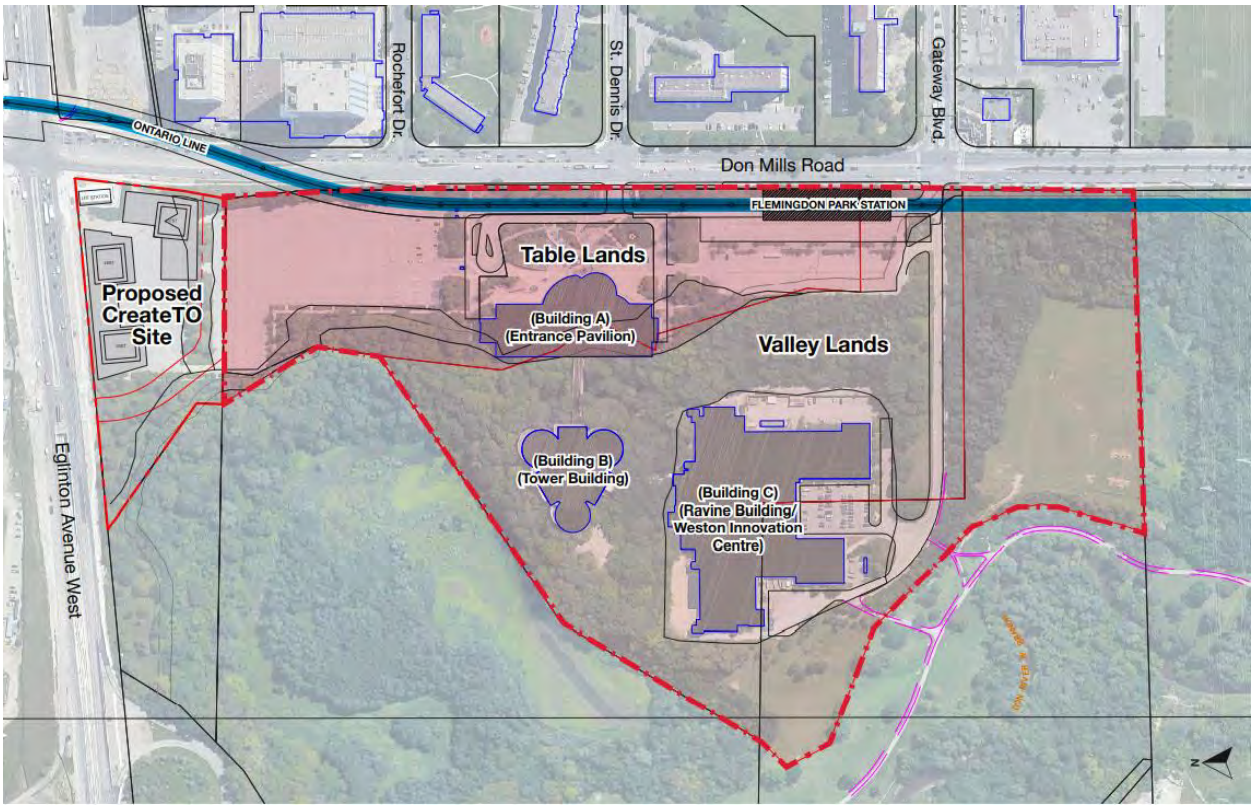
- One-time proceeds from the sale of developable lands.
- Recurring property tax revenues accruing to the City of Toronto as a result of redeveloping the lands for residential and commercial purposes.

To investigate development opportunities at the Don Mills location, IO commissioned a redevelopment feasibility analysis report (the report) to assess the redevelopment potential of the OSC site, and the land valuation associated with various development options. The report considered development options for the following land areas that are also displayed in Figure 2:[8]

- **Tablelands**: The tablelands are located along Don Mills Road and are currently occupied by several surface parking lots, the OSC entrance pavilion (Building A), and the entrance plaza.
- **Valley Lands**: The valley lands slope down into the Don River Valley and are heavily vegetated. These lands are currently occupied by the tower building (Building B) and the valley building (Building C).

[8] Infrastructure Ontario, *"Ontario Science Centre Redevelopment Feasibility Analysis"*

Figure 2: OSC redevelopment study area[9]



Each tablelands development option incorporates transit-oriented community approaches, which aim to provide opportunities to build vibrant, higher-density, mixed use communities that are connected to transit stations. The valley lands development options propose alterations to Building C to include new cultural, institutional, or non-residential uses such as office space, employment uses, or long-term care. For more detail regarding the various development options, see Appendix A.1.

Table 10 provides an overview of each development option's estimated land value and GFA. The land values provided in the report were calculated based on a hypothetical assumed 'end state' whereby all transit infrastructure is in place and operation. In addition, the land values are net of all retrofitting, demolition, or community space construction costs associated with OSC lands.

[9] Ibid

Table 10: OSC lands development options specifications[10]

Development option	Land value estimate ($m)	Residential GFA (sf, thousands)	Non-residential GFA (sf, thousands)	Commercial / retail GFA (sf, thousands)
Tablelands - Option 1	$283.8	2,025.4	159.1	31.7
Tablelands - Option 2A	$305.7	2,078.1	235.6	31.7
Tablelands - Option 2B	$345.1	2,344.6	195.7	31.7
Tablelands – Option 3	$332.4	2,534.0	230.2	37.4
Valley lands – Option 1	$5.7	-	157.8	-
Valley lands – Option 2	$16.6	-	187.3	-
Valley lands – Option 3	$40.1	-	386.7	-

The land values provided above were used to estimate the first stream of land value uplift and tax gain, which includes one-time proceeds from the sale of developable lands.

Table 11 provides an overview of the key parameters and assumptions used to calculate the second stream benefits, which includes ongoing property tax revenues accruing to the City of Toronto as a result of the redeveloping the lands for residential and commercial purposes.

Table 11: Tax gain parameters and assumptions

	Residential GFA	Non-residential GFA	Commercial/retail GFA
Price per sf estimate[11]	$1,200	$280	$500
City of Toronto property tax rate[12]	0.63%	2.12%	2.12%

For the purposes of calculating the ongoing property tax revenue for the City of Toronto, a 50-year appraisal period from 2023/24 was assumed, which is in line with the broader OSC economic and financial analysis. In addition, a 10-year construction timeframe was applied as a conservative assumption for each development option given the amount of preparation works that are required prior to land sales, and the overall size of each development.

[10] Ibid

[11] Residential price estimate was informed by recent multi-residential sales in East York, Toronto. This data was sourced from Urbanation.

Non-residential and commercial price estimates were informed by recent retail and office development sales in Toronto. This data was sourced from CoStar Group and licensed to EY.

[12] City of Toronto, 2022 Property Tax Rates. Accessed at https://www.toronto.ca/services-payments/property-taxes-utilities/property-tax/property-tax-rates-and-fees/

Table 12 presents the outcomes of the land value uplift and tax gain analysis for each development proposed development options.

Table 12: Tax gain results

Development option	Land value sale ($m)	Present value of property taxes ($m)	**Total tax gain ($m)**
Tablelands - Option 1	$283.8	$294.8	**$578.6**
Tablelands - Option 2A	$305.7	$309.9	**$615.6**
Tablelands - Option 2B	$345.1	$341.5	**$686.6**
Tablelands – Option 3	$332.4	$371.7	**$704.1**
Valley lands – Option 1	$5.7	$16.6	**$22.3**
Valley lands – Option 2	$16.6	$19.7	**$36.3**
Valley lands – Option 3	$40.1	$40.7	**$80.8**

Based on the land valuations and property tax revenue estimates, the present value of future tax revenue accruing to the City of Toronto over a 50-year period would range between:

- **Tablelands**: $578.6 million to $704.1 million
- **Valley Lands**: $22.3 million to $80.8 million
- **Total tax gain**: **$600.9 million to $784.9 million**

3.4.2. Synergies with surrounding infrastructure and developments

Residential developments

The GTA housing market is ranked as one of the least affordable in the world, and the 11th most expensive city for a downtown 700 sf condominium as of June 2023. Domestically, Toronto has the highest median price for a condominium of all major Canadian cities at $738,569 as of September 2023. In addition, Toronto ranks last of all major Canadian cities in key affordability metrics such as mortgage repayments as a percentage of income, with a median price condominium requiring approximately 54.8% of an individual median income in Toronto.[13] A lack of affordable housing may cause many social and economic issues, such as an increase in poverty, homelessness, negative health outcomes, educational disparities,

[13] National Bank of Canada, Housing Affordability Monitor Q3 2022. Accessed at https://www.nbc.ca/content/dam/bnc/taux-analyses/analyse-eco/logement/housing-affordability.pdf

and sluggish GDP growth. With demand for Toronto real estate to likely to remain high, increasing the supply of housing is crucial to place downward pressure on prices and improve affordability.

As described in Section 3.4.1, relocating the OSC to Ontario Place would enable OSC land at Don Mills to be redeveloped into mixed-use residential and commercial space. The GFA of tablelands development options in Table 10 shows that the vast majority of development is classified as multi-residential. The average multi-residential area of the options is approximately 2.2 million sf, which represents a significant increase to housing supply in the East York area of Toronto.

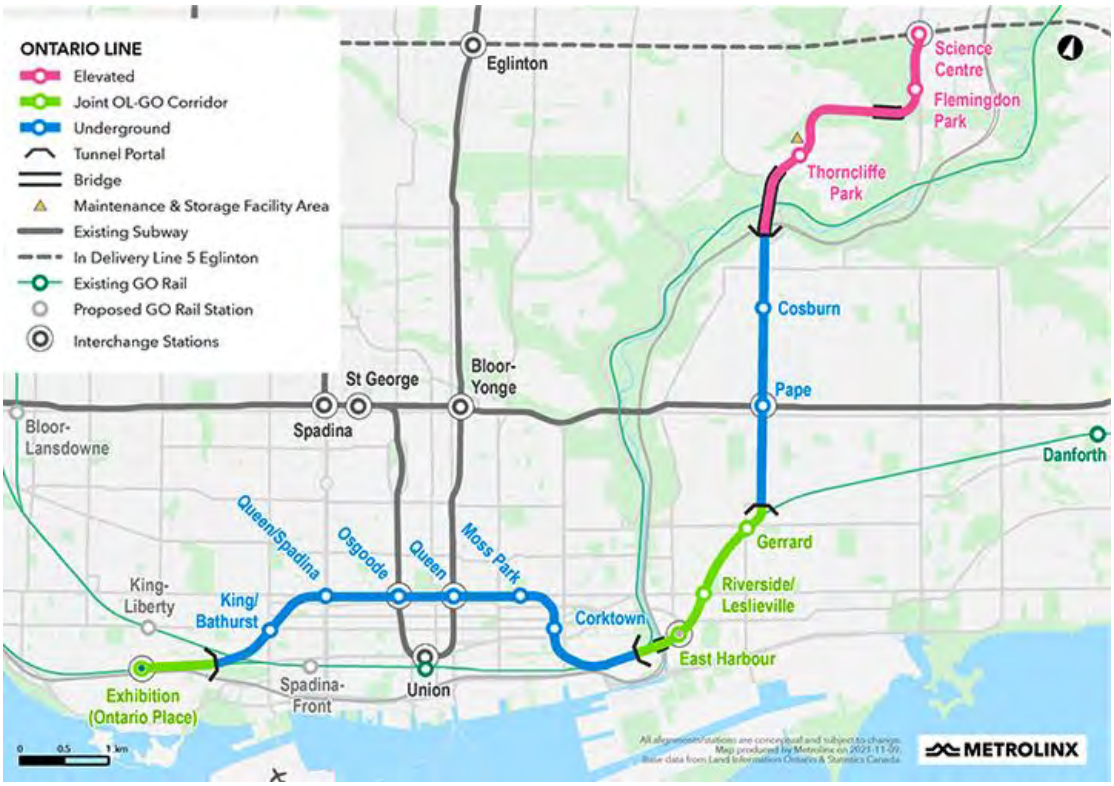
According to recent multi-residential development sales in the East York area of Toronto, the average dwelling size is approximately 800 sf.[14] Applying this benchmark to the tablelands development options results in an estimated increase in Toronto's housing supply of approximately 2,500 to 3,000 dwellings.

Transport infrastructure

The proposed Ontario Line is one of four priority transit projects announced by the Government of Ontario in 2019 for the Greater Toronto and Hamilton Area. The 15.6-kilometre rapid transit line will connect the current OSC location at Don Mills to its new proposed location at Ontario Place, as shown in Figure 3.

[14] Urbanation, East York multi-residential sales from 2017 to 2022

Figure 3: Ontario Line route map[15]



When operational, Ontario Line ridership is estimated to be 388,000 daily boardings. In addition, 227,500 more residents will be within walking distance rapid transit modes, 47,000 more jobs will be accessible in 45 minutes or less, and 28,000 fewer cars will be on the Toronto Road network.[16]

By relocating the OSC to Ontario Place and increasing housing supply at the Don Mills location, ridership for the Ontario Line may increase as more residents will be located in close proximity to the Ontario Line, and the new OSC location will be more accessible at a central downtown location. Improved access to the OSC may also drive an increase in visitation and revenue growth, which will improve the financial sustainability of the OSC.

Driving increased ridership on the Ontario Line through residential developments at Don Mills and at Ontario Place will also provide the Government of Ontario with increased fare-box revenue, which will improve the feasibility of the project from a fiscal and value for money perspective.

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[15] Infrastructure Ontario, Ontario Line. Accessed at https://www.infrastructureontario.ca/Ontario-line/

[16] Metrolinx, Ontario Line. Accessed at https://www.metrolinx.com/en/projects-and-programs/ontario-line

Ontario Place precinct

The Ontario Place precinct includes 155 acres of pristine waterfront property near downtown Toronto. In January 2019, the Government of Ontario announced a new vision for Ontario Place to become a world-class year-round destination for the people of Ontario and visitors that may include sport and entertainment landmarks, as well as retail. Recreational facilities, public spaces and parks, and the existing amphitheatre and Cinesphere Theatre could complement these offerings.[17]

The clustering of entertainment and cultural offerings at Ontario Place may facilitate increased visitation to OSC by increasing the appeal and ease for visitors to visit multiple attractions at the one location. The new location may also drive increased visitation and tourism due to the close proximity to the heavily populated downtown Toronto area with many restaurants, retail outlets, hotels, and other tourist and recreational offerings.

In addition, the OSC and other entertainment venues and offerings co-locating at Ontario Place may benefit from agglomeration economic benefits. These benefits occur when firms and people locate near one another in cities and industrial clusters. Agglomeration economic benefits that may occur at Ontario Place include:[18]

- More efficient use of infrastructure through co-location. For example, concentrated entertainment offerings at Ontario Place may increase ridership of the Ontario Line and lower transportation costs for visitors. In addition, transportation efficiencies driven by industry concentration are generally less environmentally harmful than spreading urban developments throughout the GTA.
- Industry concentration results in a larger, deeper, more specialized labour pool which enables workers to better match their skills to the needs of firms.
- Agglomeration creates knowledge spillovers in which firms and workers learn from each other.

These agglomeration economic benefits can also occur at many different geographic levels, from the microgeographic (within the OSC) to larger regional areas such as Ontario Place, downtown Toronto, and the GTA.

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[17] City of Toronto, Ontario Place Redevelopment. Accessed at https://www.toronto.ca/legdocs/mmis/2021/ex/bgrd/backgroundfile-167105.pdf

[18] W.E. Upjohn Institute for Employment Research, Agglomeration Economics: A Literature Review. Accessed at https://research.upjohn.org/cgi/viewcontent.cgi?article=1256&context=reports#:~:text=The%20benefits%20of%20agglomeration%20economies,sharing%2C%20matching%2C%20and%20learning.&text=Sharing%20infrastructure%20is%20more%20efficient,in%20closer%20proximity%20to%20customers.

3.4.3. Increased tourism

The relocation of the OSC to Ontario Place may also benefit the City of Toronto and the GTA by driving increased tourism. Analysis undertaken throughout Section 3 considers impacts of direct spending at the OSC, and therefore the results exclude any additional direct spending in alternative sectors (e.g., accommodation, retail outlets). It is likely that tourists visiting OSC at Ontario Place will spend and consume other goods and services in nearby establishments.

The Relocate option is forecast to drive increased tourism for the city and the region through higher OSC visitation. The Downtown Toronto area is a major hub for tourism in the city, with many popular attractions and landmarks. By relocating the OSC to this location, areas around Ontario Place may benefit from increased foot traffic, having a broad range of positive impacts for the city.

Increased tourism will likely result in broader expenditure impacts for the city. As tourists visit OSC at Ontario Place and any other surrounding areas, they will likely spend money on a variety of goods and services. This includes purchases at local stores and restaurants, as well as increased spending on accommodation and transportation services. This increased spending provides an additional boost to the local economy and generates revenues for businesses, further creating jobs in the area. Furthermore, visitation at the OSC may support other activities around the area, as tourists are likely to consider engaging in additional attractions and experiences (e.g., concerts, sporting events, fairs) as they are located within close proximity.

Additionally, tourism boosts from relocating OSC to Ontario Place may also include increased labour opportunities for workers in the area as demands for goods and services increases, development of new businesses in the area, additional recreational activities for local residents, and development of additional infrastructure and amenities in the area (such as public transportation and improved pedestrian access), amongst others.

Table 13 shows Toronto's visitation numbers for the 2018 period, while Table 14 shows total visitor spending for the city, by type of trip and origin. Pre-COVID-19 pandemic figures were selected since these are more representative of the visitation estimates that can be expected going forward.

Table 13: Visitors to Toronto, 2018

(in millions)[19]	Number of visitors		Total number of visitors
	Day trip	Overnight	
Domestic	17.3	6.3	23.6
U.S.	0.5	1.9	2.4
Overseas	0.3	1.3	1.6
Total	**18.1**	**9.5**	**27.6**

Table 14: Visitor spending in Toronto, 2018

(in billions of $, 2023)[19]	Expenses		
	Day trip	Overnight	Total expenses
Domestic	1.7	2.0	3.7
U.S.	0.1	1.4	1.5
Overseas	0.1	1.6	1.7
Total	**1.9**	**5.0**	**6.9**

The City of Toronto benefits greatly from tourism and tourism-related activities. In 2018, Toronto had almost 28 million visitors, with 10 million of those staying overnight. In total, visitors to the city spent just under $7 billion during their time there. This expenditure from tourist visitation has large economic impacts for the city and the province, which can be further enhanced by a new OSC at Ontario Place.

3.4.4. Staffing

Labour costs are the largest cost for the OSC, comprising of 60.0% of total operating costs in 2018/19 prior to any operational impacts from the COVID-19 pandemic. A newly designed OSC at Ontario Place may provide an opportunity to realize operational efficiencies due to a smaller and more efficient building layout. These efficiency improvements may allow OSC staff to be redeployed to other functions to support new offerings or increased operational hours at Ontario Place.

[19] Destination Toronto, Visitor Economic Study. Accessed at https://www.destinationtoronto.com/research/business-intelligence/visitor-economy-study/

4. Fiscal Impact Assessment Results

The fiscal impact analysis is critical to assess the budgetary impact of each project option for the Government of Ontario. The analysis in this section:

- Evaluates the fiscal impacts of each project option.
- Evaluates the net cash flow impact of each project option.
- Estimates the economic impact of reinvesting the operational savings from relocating OSC at Ontario Place.

4.1. Fiscal impact analysis

Fiscal impact refers to the net impact on Government resources for a particular project or program. To provide a holistic analysis of each project option, it is important to consider the fiscal impacts and draw on public resources. Fiscal impact analysis also includes consideration of opportunity cost for the Government, which represents the foregone benefit of increased spending on another program or project. Therefore, any operational efficiencies regarding the OSC project options can provide the Government of Ontario with additional resources to fund other Government projects or programs.

EY has undertaken a fiscal impact analysis derived from the financial results of each project option, and with consideration to public sector accounting guidance. Given the OSC is considered an institutional and cultural development, public sector accounting guidance suggests the capitalization of capital costs for each project option no matter if it is classified as a redevelopment or construction of a new asset. Maintenance costs generally do not qualify for capitalization and are therefore classified as operational expenditure and expensed in the period incurred.[20] For OSC, costs incurred for deferred maintenance are fiscally considered as operational expenses, as these costs are aimed at critical maintenance and repairs to the OSC asset rather than maintaining or extending the life of the asset.

Table 15, Table 16, and Table 17 summarize the 5-year, 10-year, and 50-year fiscal impact on a nominal and real basis for each project option.

[20] Government of Canada, Directive on Account Standards: GC 3150 Tangible Capital Assets. Accessed at https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=32518

Table 15: 5-year fiscal impact ($m)

Real	Remain on Site	Relocate
Operating costs	$(195.8)	$(172.9)
Deferred maintenance	$(155.5)	$(30.5)
Capital costs	$(4.2)	-
Revenues	$67.9	$59.3
Fiscal Impact	$(287.7)	$(144.2)
Net fiscal impact compared to option 1	-	**$143.5**
Nominal	Remain on Site	Relocate
Operating costs	$(207.9)	$(183.0)
Deferred maintenance	$(163.9)	$(32.3)
Capital costs	$(4.7)	-
Revenues	$72.2	$62.6
Fiscal Impact	$(304.3)	$(152.7)
Net fiscal impact compared to option 1	-	**$151.6**

Table 16: 10-year fiscal impact ($m)

Real	Remain on Site	Relocate
Operating costs	$(397.3)	$(338.4)
Deferred maintenance	$(224.6)	$(30.5)
Capital costs	$(24.1)	$(53.6)
Revenues	$151.7	$136.0
Fiscal Impact	$(494.3)	$(286.6)
Net fiscal impact compared to option 1	-	**$207.7**
Nominal	Remain on Site	Relocate
Operating costs	$(444.0)	$(376.8)
Deferred maintenance	$(244.8)	$(32.3)
Capital costs	$(28.0)	$(62.8)
Revenues	$170.4	$153.0
Fiscal Impact	$(546.4)	$(319.0)
Net fiscal impact compared to option 1	-	**$227.4**

Table 17: 50-year fiscal impact ($m)

Real	Remain on Site	Relocate
Operating costs	$(1,858.2)	$(1,504.4)
Deferred maintenance	$(318.3)	$(30.5)
Capital costs	$(81.9)	$(275.4)
Revenues	$770.4	$743.7
Fiscal Impact	$(1,487.9)	$(1,066.6)
Net fiscal impact compared to option 1	-	**$421.3**
Nominal	Remain on Site	Relocate
Operating costs	$(3,156.7)	$(2,540.1)
Deferred maintenance	$(368.7)	$(32.3)
Capital costs	$(115.8)	$(430.5)
Revenues	$1,321.2	$1,279.4
Fiscal Impact	$(2,320.0)	$(1,723.5)
Net fiscal impact compared to option 1	-	**$596.5**

The results above show that the Relocate option would provide fiscal savings to the Government of Ontario over the 50-year appraisal period of **$421 million** in real 2023/24 dollars, and **$597 million** in nominal terms. In addition, the Relocate option has a smaller fiscal impact than Remain on Site over 5-year and 10-year periods due to lower operating costs.

4.2. Cash analysis

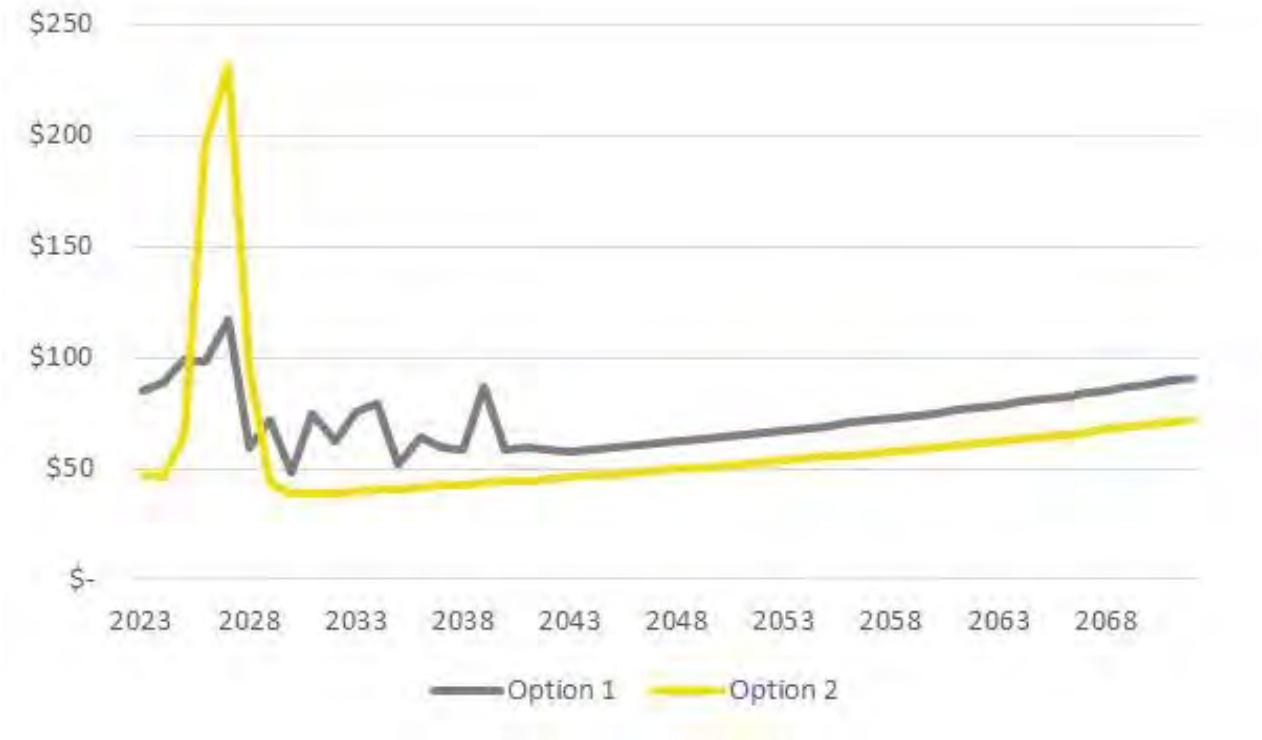
Following the results from the fiscal impact analysis in Section 4.1, net cash flows on a nominal basis over the 50-year appraisal period (consistent with the financial analysis) are summarized in Table 18.

Table 18: Cash analysis results ($m, nominal)

	Remain on Site	Relocate
Revenue	$1,321.2	$1,279.4
Costs to Government	$(3,641.2)	$(3,002.9)
Net cash flow	**$(2,320.0)**	**$(1,723.5)**

Figure 4 shows graphically that the Relocate option provides significant savings to the Government of Ontario over the 50-year appraisal period despite large upfront capital costs. The figure shows the impact of lower operating costs and higher revenues on net cash flow for the Government.

Figure 4: Costs to Government ($m, nominal)



4.3. Reinvestment of savings

It is noted that the Relocate option will result in approximately $421 million of real savings as compared to the Remain on Site option. It is assumed the Government of Ontario would apply these fiscal savings to reinvest in other areas, such as infrastructure, transit, etc. Although the economic impact analysis done in Section 3 does not include the reinvestment of the fiscal savings, EY has provided a hypothetical analysis of the reinvestment of the $421 million real savings based on an estimate of the current government ratio of capital spending and operations spending.

According to the Government of Ontario's 2023-23 estimates, Table 19 displays the potential spend on Economic Development, Job Creation and Trade, as well as Infrastructure.

Table 19: Estimated capital and operations spend by the Ministry of Economic Development, Job Creation and Trade, and the Ministry of Infrastructure, 2023-23

	2022-23 Estimates[21,22]	
Operating	972.6	34%
Capital	1,924.7	66%
Total	**2,897.3**	

EY has applied the allocation to operating and capital spend to the **$421 million** real savings. It has been assumed that approximately **$141 million** will be invested into operation spend and **$280 million** will be invested into construction (capital) spend.

The summary tables (Table 20, Table 21 and Table 21) illustrate the potential GDP impact from the reinvestment spending of **$421 million** in fiscal savings.

Table 20: GDP impacts ($m, real 2023)

	Total	Annual
GDP from construction	268.6	5.4
GDP from operations	140.8	2.8
Total	**409.4**	**8.2**

Table 21: Employment impacts

	Total	Annual
Jobs from construction	2,484	50
Jobs from operations	1,157	23
Total	**3,641**	**73**

Table 22: Tax impacts ($m, real 2023)

	Total	Annual
Personal taxes	17.6	0.4
Sales taxes	12.6	0.3
Corporate taxes	9.2	0.2
Other taxes	7.9	0.2
Total	**47.4**	**0.9**

[21] Government of Ontario, Capital Expenditure Estimates 2022-23. Accessed at https://www.ontario.ca/page/summary-table-6-capital-2022-23

[22] Government of Ontario, Operating Expenditure Estimates 2022-23. Accessed at https://www.ontario.ca/page/summary-table-2-operating-2022-23

Appendix

A.1 OSC lands development options

Each OSC tablelands and valley lands development option is briefly described in Table 23. The building designations in the descriptions refer to those displayed in Figure 2.

Table 23: OSC lands development options[23]

Tablelands options	Description
Option 1	This option proposes a range of 30- to 45-storey mixed-use buildings along Don Mills Road, with the highest buildings located adjacent to the proposed transit stations. This option retains the existing OSC Building A, which may be retrofitted and/or repurposed for cultural, institutional, or other non-residential uses such as commercial, retail, office or employment uses.
Option 2A	This option illustrates a range of 30- to 45-storey mixed-use buildings along Don Mills Road, with the highest buildings located adjacent to the proposed transit stations. In addition, this option proposes to restore the original OSC facade by demolishing the existing IMAX portion and adding an 8-storey addition on top of the retained portions of the building (Building A). The existing building may be retrofitted, repurposed, and added to for cultural, institutional or other non-residential uses, with additional non-residential GFA provided through the new addition. Non-residential uses may include commercial, office, retail or employment uses.
Option 2B	An alternative for Option 2 ('2B') was prepared with additional intensification in the centre block. This alternative Option 2B includes the addition of a 12-storey non-residential and 35-storey residential towers on top of the retained portions of the OSC building (Building A). The existing building may be retrofitted, repurposed, and added onto for cultural, institutional or other non-residential uses, with non-residential and residential GFA provided through the two new additions on top. Non-residential uses may include commercial, office, retail or employment uses.

[23] Infrastructure Ontario, *"Ontario Science Centre Redevelopment Feasibility Analysis"*

Option 3	This option proposes redevelopment of the entire site, including the demolition of the existing OSC building and the construction of a series of new 25- to 45-storey mixed-use buildings across the site. The new buildings at the site of the existing OSC building is envisioned to include cultural, institutional, or other non-residential uses, in addition to the residential component(s). Non-residential uses may include office, commercial, retail, or employment uses.
Valley lands options	**Description**
Option 1	This option proposes to retain Building C (Ravine/Weston Innovation Building) and an additional level (of similar footprint) above the retained portions of the building (Building C – Ravine Lands) and a two-level parking structure in place of the existing surface parking lot. The existing building may be retrofitted, repurposed, with new cultural, institutional or non-residential / office / employment uses.
Option 2	This option proposes to retain Building C (Ravine/Weston Innovation Building) and adds three additional levels of non-residential/office/employment uses above the eastern portion and one additional level of non-residential / office / employment above the of western portion of the retained building (Building C – Ravine Lands). A two-level parking structure is located in place of the existing surface parking lot. The existing building may be retrofitted, repurposed, with the new cultural, institutional or non-residential uses.
Option 3	This option proposes the re-adaptation of the existing Building C (Ravine/Weston Innovation Building) into a mixed-use hub with one level of cultural/institutional uses and three additional levels of non-residential/office/employment and three additional levels of long-term care uses. On the southern portion, one level of cultural institutional uses is proposed above a two-level parking structure. The proposed uses do not exceed the existing building footprint of Building C.

A.2 The Input-Output Model: Approach and Restrictions

An I-O model is subject to limitations both in concept and implementation. Like any economic model, the I-O model is conceptually an abstraction that attempts to be complex enough to accurately capture and estimate the most significant impacts to the real-life economy caused by an economic activity, yet simple enough to be analytically and intuitively meaningful.

Generally speaking, an I-O model reflects the observed interdependency between all the sectors of the economy. Specifically for Canada, Statistics Canada reports for 236 industrial sectors in the economy: (1) how each sector relies on the other 235 sectors for inputs to their production; and (2) how each sector supplies its products and services to each of the remaining 235 sectors. While an I-O model provides a consistent and intuitive way of measuring the economic effects of an economic activity, users should be aware of the assumptions and limitations of the I-O model's underlying approach, and in turn regarded its results merely as approximations. Some of these assumptions include:

- The relationship between industry inputs and outputs is linear and fixed, meaning that a change in demand for the outputs of any industry will result in a proportional change in production. The model cannot account for economies/diseconomies of scale or structural changes in production technologies, an assumption which does not necessarily hold in the actual economy;
- Prices are fixed in the model;
- I-O models are static and does not consider the amount of time required for changes to happen. As such, in the context of this study the model implicitly assumes that all the ripple effects in the economy take place within one year. Changing the timeframe would not affect the magnitude of the effects estimated;
- There are no capacity constraints, and all industries are operating at capacity. This implies that an increase in output results in an increase in demand for labour (rather than simply re-deploying existing labour). It also implies that there is no displacement that may occur in existing industries as new projects are completed;
- I-O models assume that the technology and resource mix (ratios for inputs and production) is the same for all firms within each industry, i.e., the 236 industry categories reported in Statistics Canada's input-output table. As such, our analysis describes industry average effects; and
- The model assumes that the structure of the economy remains unchanged, looking as it did in 2018 (the most recent year of Statistics Canada's latest available input-output table). Any structural changes in the economy since 2018 will therefore lead to changes to the multipliers, which could be implemented once Statistics Canada release updated input-output tables. As such, the more removed the year of analysis is from the year of the used input-output tables, the greater the uncertainties.

As per the assumptions above, the structure and limitations of I-O models lend themselves to measuring the impacts of projects that are shorter term in nature; generally, they are used to look at shocks to the

economy. For longer-term, time series analysis and general equilibrium models are likely to be more appropriate.

Lastly, EY has relied upon the completeness, accuracy and fair presentation of all information, data, advice, opinions or representations obtained from public sources, IO, the Ministry of Tourism, Culture, and Sport, and the OSC (collectively the "Information"). The findings of this report are conditional upon such completeness, accuracy and fair presentation of the Information as EY has not independently verified or audited the Information provided to us.