

Markham Pan Am Centre Vestibule General Committee

January 20, 2020

Agenda

- Background
- Issue Summary
- Low Cost Solutions Applied Since 2017
- Permanent Solution Options
 - Pros and Cons
 - Total Cost of Ownership Comparison
- Financials
- Recommendation



Background

- Markham Pan Am Centre was built in partnership with TO2015 Pan Am Games by Infrastructure Ontario with funding from the Province of Ontario, Federal Government and the City of Markham
- Markham Pan Am Centre (MPAC) was a host venue during the Pan Am Games for four major sports.
- Post Games the MPAC continues to host international, national and provincial games along with be a training venue for aquatics, and Rhythmic Gymnastics – hosting events almost every weekend making use of both fields of play, the lobby, meeting rooms and community rooms.
- The major entrance/ lobby plays a critical role for sporting events.
- Staff submitted a capital project in 2020 to permanent address the uncomfortable cold condition in the lobby affecting staff and patrons.
- Council approved the capital project with the condition that staff report back on options to add the issue.

Issue Summary

- Position of lobby doors allows significant exchange of “blow through air” that overwhelms the mechanical system, resulting in low temperatures in the lobby
- Vestibules aren't deep enough to contain heat in the lobby when doors are opened
- Large events with many participants worsen the situation



Issue Summary (continued)

- The Pan Am lobby does not retain adequate heat during the winter months – it is well below industry standards.
- Recorded temperatures in main lobby (with temporary solutions in place)
 - January 2019 – Average Temp = **14° C**
 - January 2019 – Temp Range = 6° C (2 days) to 22.4°C(1 day)
 - February 19-27, 2019 – Average Temp = 20.7°C
 - February 19-27, 2019 – Temp Range = 14.7° – 22.9°C
 - Lobby temperature for enjoyment of users is designed to be on average **20 – 22°C**
 - Employment Standard Act Regulations as per Ontario Ministry of Labour identify that **18°C** is deemed acceptable.

No/Low Cost Solutions Applied Since 2017

- Closed off one entrance to minimize wind tunnel effect
- Completed analysis of the overall heating system
- Balanced the HVAC system
- Optimized the BAS system
- MDE has optimized their feed – no impact
- Installed large ceiling fans to de-stratify the air above
- Installed a heater at the reception desk
- Installed large industrial heater for the lobby

All of these measures combined have not been enough to fully correct or adequately address the temperature issue in the main lobby.

Permanent Solution Options

1. Industrial Electric Heater
2. Wind Screen
3. Seasonal Vinyl Vestibule
4. Revolving Door
5. Permanent Vestibule
 - a) South Door Option (recommended option)
 - b) East Door Option
 - c) Inside Option

1. Industrial Electric Heater

- As a temporary measure, this has been installed.
- Not very energy efficient and wouldn't qualify for LEED.
- Does not solve the problem as the volume of air leaving is still too great.
- Risk of open unit in a public place.
- Units are noisy
- If this measure was to become the ongoing solution, a protective enclosure would be required and additional units required throughout lobby.
- Costly for longer term use



2. Wind Screen

- Whitby Abilities Centre struggling with the same issue
- Opted to construct wind screens
- Not working well, staff are still bundled up to keep warm
- Whitby has determined they will need something else to address this concern
- Removed as an option to consider further based on Whitby's experience



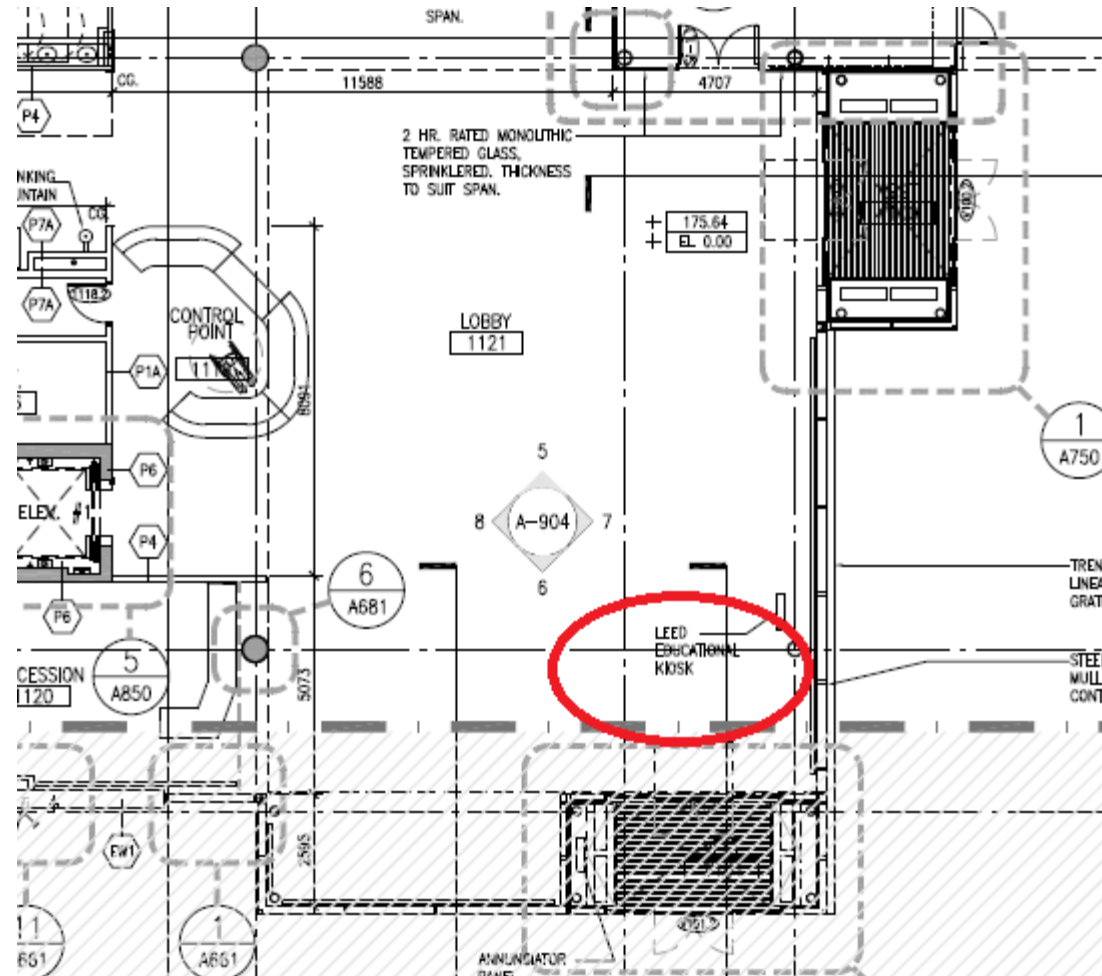
3. Seasonal Vinyl Vestibule

- Canopy and side panels with clear windows, aluminum frame and vinyl fabric.
- Would be fastened to the building through window mullions and roof top cap, these fasteners can cause future building envelope issues
- Accessible door (required) cannot be removed during the summer months but panels can be.
- Structure and roof should remain year round or storage area would be required.
- Price includes limited graphic on the vinyl.
- Vestibule is not heated.



4. Revolving Door

- Door would be installed in the lobby past the current vestibule footprint.
- Large enough to accommodate accessible needs.
- Would require more ongoing maintenance as it has more moving parts.
- Takes up foot print within lobby space reducing area for large events.



5a. Permanent Vestibule Outside – South Doors

- New permanent and heated structure **recommended** to be constructed
- Will reduce the volume of conditioned air leaving the building and cut off the blow-through effect that currently exists.
- This option addresses the core issues the best and doesn't negatively impact the function of the building/hosting sporting events.



5b. Permanent Vestibule Outside – East Doors

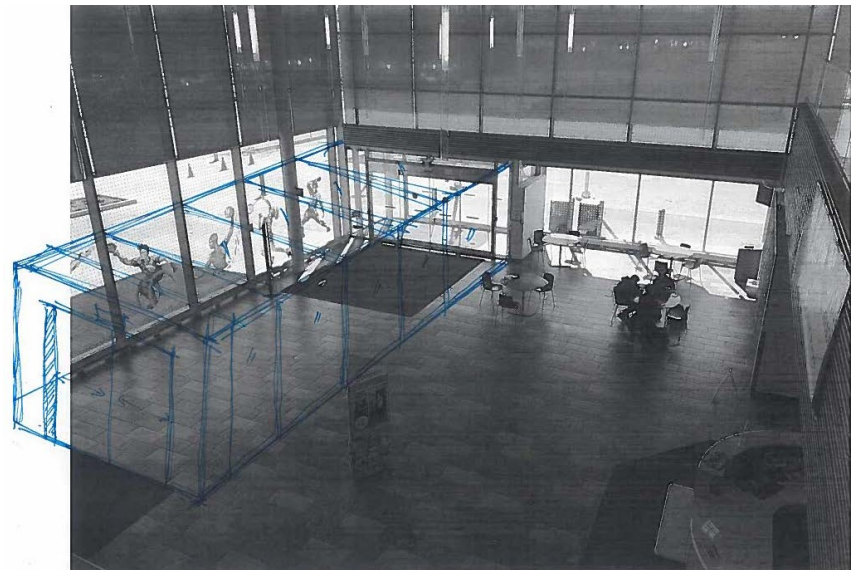
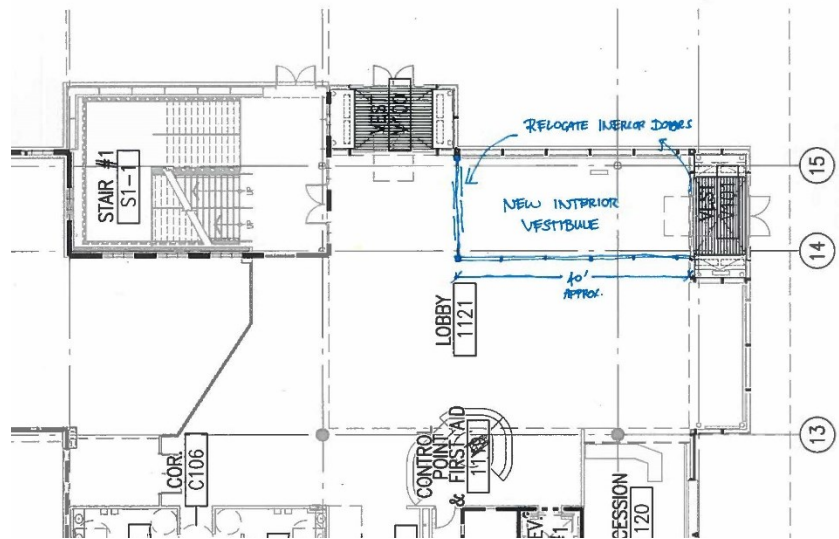
New door- east side of building

- Need to create new vestibule and openings in building envelope
- Would be a permanent and heated structure.
- Would reduce the volume of conditioned air leaving the building and cut off the blow-through effect that currently exists.
- Would require additional curtain wall and heating system modifications to the existing building on top of the cost of the vestibule (approx. \$100,000)



5c. Permanent Vestibule Inside

- Permanent heated structure.
- Would reduce the volume of conditioned air leaving the building and cut off the blow-through effect that currently exists.
- Would take up a significant amount of space indoors



Option Pros and Cons

Options	Pros	Cons
1. Industrial Heater	<ul style="list-style-type: none"> Assists with increasing temperatures in the lobby area – impact is minimal 	<ul style="list-style-type: none"> Not aesthetically pleasing, some safety concerns from hot surfaces Temps. not held as doors open heated air escapes – not solving the problem Doesn't comply with LEED standards - not energy efficient
3. Seasonal Vinyl Vestibule	<ul style="list-style-type: none"> May reduce heat loss out of the building May act as a wind screen for cold air coming in Lower cost 	<ul style="list-style-type: none"> Not aesthetically pleasing May not solve the low temperatures in the lobby (not heated) Large maintenance component
4. Revolving Door	<ul style="list-style-type: none"> Consistent with aesthetics of building Will provide a buffer for heat loss out of the building Will allow temperatures to rise in the lobby area Complies with LEED building standards 	<ul style="list-style-type: none"> Will take up lobby space Will still move cooler air into the space Anticipate higher ongoing Maintenance costs Highest Capital Cost
5a, b. Permanent Vestibule Outside	<ul style="list-style-type: none"> Consistent with aesthetics of building – most aesthetically pleasing Will provide a buffer for heat loss out of the building Will preheat air before entering the lobby Will allow temperatures to rise in the lobby area reducing overall utility costs Complies with LEED building standards 	<ul style="list-style-type: none"> High Capital Cost East Door Option would require additional \$100, 000 for structural, curtain wall and heating modifications Option 5b requires additional and more expensive modifications to building
5c. Permanent Vestibule Inside	<ul style="list-style-type: none"> Will provide a buffer for heat loss out of the building Will preheat air before entering the lobby Will allow temperatures to rise in the lobby area reducing overall utility costs Complies with LEED building standards 	<ul style="list-style-type: none"> High Capital Cost Significant loss of lobby area - Not aesthetically pleasing Impacts hosting opportunities for larger international/national events

Option Total Cost of Ownership

Options	Capital Purchase	Lifespan (years)	Maintenance/Operating (clean, store, install, removal, repairs, utilities)	25 year lifecycle	With HST Impact
1. Industrial Heater	\$8000	10	<ul style="list-style-type: none"> Install/Removal \$2500 yearly Utilities \$11,500 yearly 	\$438,848	\$446,572
3. Seasonal Vinyl Vestibule	\$78,320	<ul style="list-style-type: none"> Frame 25 Panels 5-7 	<ul style="list-style-type: none"> Removal/Install \$1000 yearly Repairs to Vinyl \$1000 yearly Replace panels \$10,000 every 5 years 	\$178,320	\$181,458
4. Revolving Door	\$464,200	25	<ul style="list-style-type: none"> Replace rubber \$3000 seals ever 5 years Door repairs \$1500 yearly 	\$516,700	\$525,793
5a, b. Permanent Vestibule Outdoors	\$459,200 (a) \$559,200 (b)	25	<ul style="list-style-type: none"> Utilities \$2,150/yr for vestibule, will most likely result in reduced utilities overall 	\$528,065 (a) \$628,065 (b)	\$537,359 (a) \$637,350 (b)
5c. Permanent Vestibule Indoors	\$459,200	25	<ul style="list-style-type: none"> Utilities \$2,150/yr for vestibule, will most likely result in reduced utilities overall 	\$528,065	\$537,359

- Utilities include yearly escalation.

Financials

- To date **\$30,489** has been spent on Design and Tender Documents for external vestibule (Option 5a) – Throw Away Costs if there is a change in the preferred solution.
- Current Capital Budget Approved - **\$467,300** under project #20179
- Funding source is the surplus funds from the Pan Am Construction budget for deficiencies such as this.

Recommendation

Permanent South Exterior Vestibule (Option 5a.)

Will provide a buffer for heat loss out of the building

- Will preheat air before entering the lobby
- Will allow temperatures to rise in the lobby area
- Complies with LEED building standards and AODA
- No throw away cost
- This option addresses the core issues the best
- Retains the function of the building for hosting large sporting events

