

Mitchell Park Horticultural Conservatory

Task Force Meeting #1

October 12, 2016





First Conservatory & Sunken Gardens



The first conservatory was built in 1898. This conservatory exhibited flowers in a "greenhouse" setting and served the public until 1955.

It was determined to be unsafe and impractical to repair, so it was demolished.

Sunken Gardens, Mitchell Park
August 2, 1914





Mitchell Park Conservatory Mission



OUR MISSION

To provide the residents and their visitors a horticultural showcase featuring five changing floral shows per year, examples of tropical and arid flora displayed as naturally as possible, educational opportunities, cultural programs, horticultural information, and the protection of certain rare and endangered species.



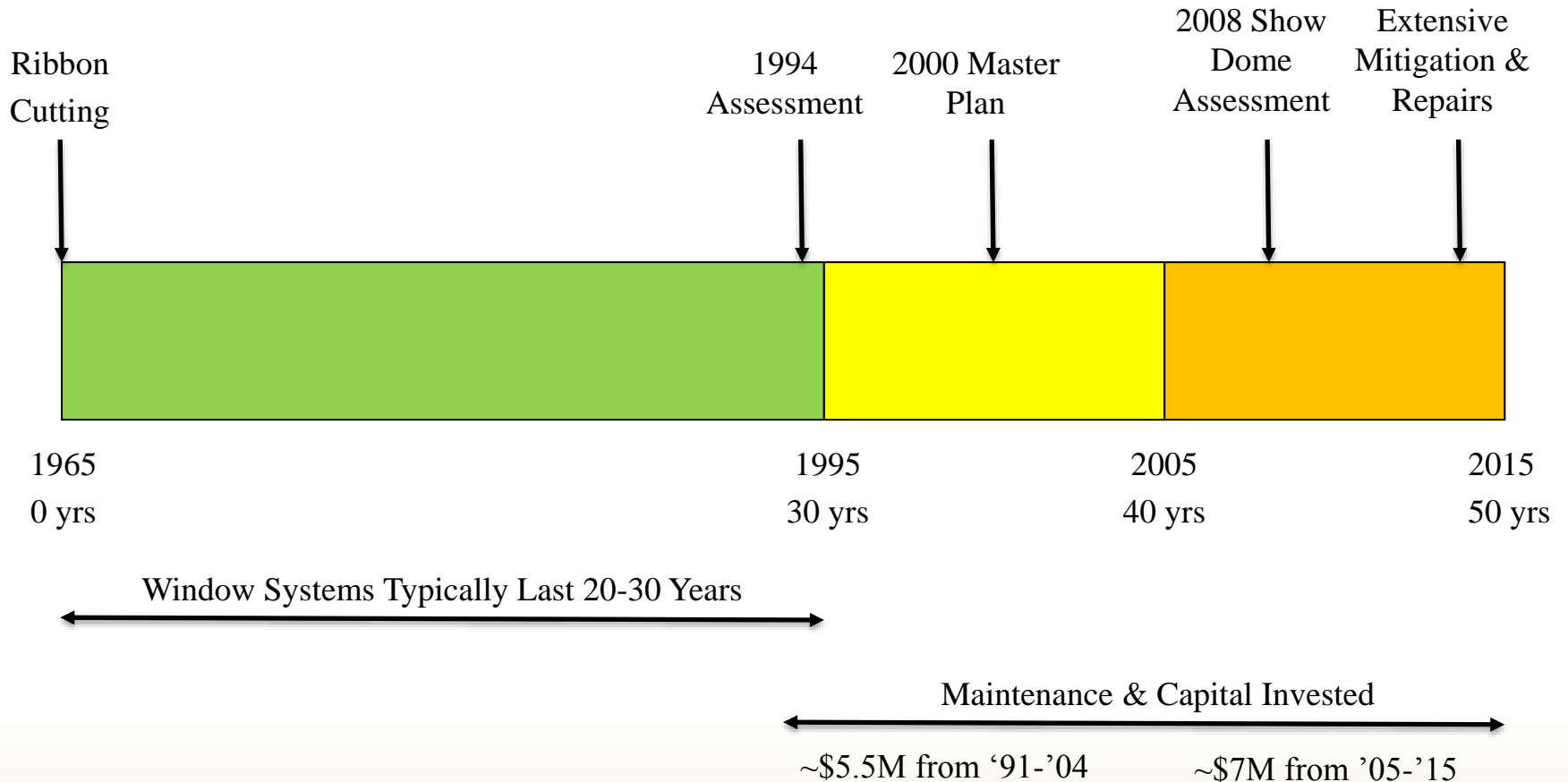


Physical Structure Review

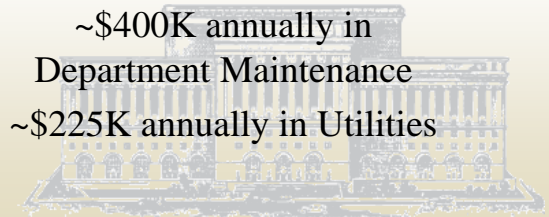




Domes Engineering Timeline



1994 to Current: Until the water infiltration is stopped, the Domes will continue to deteriorate.





Geodesic Dome Construction



Geodesic Domes

- Underlying shape is spherical
- Windows can be same size
- Integrated construction, with window systems (frames) part of load-bearing structure



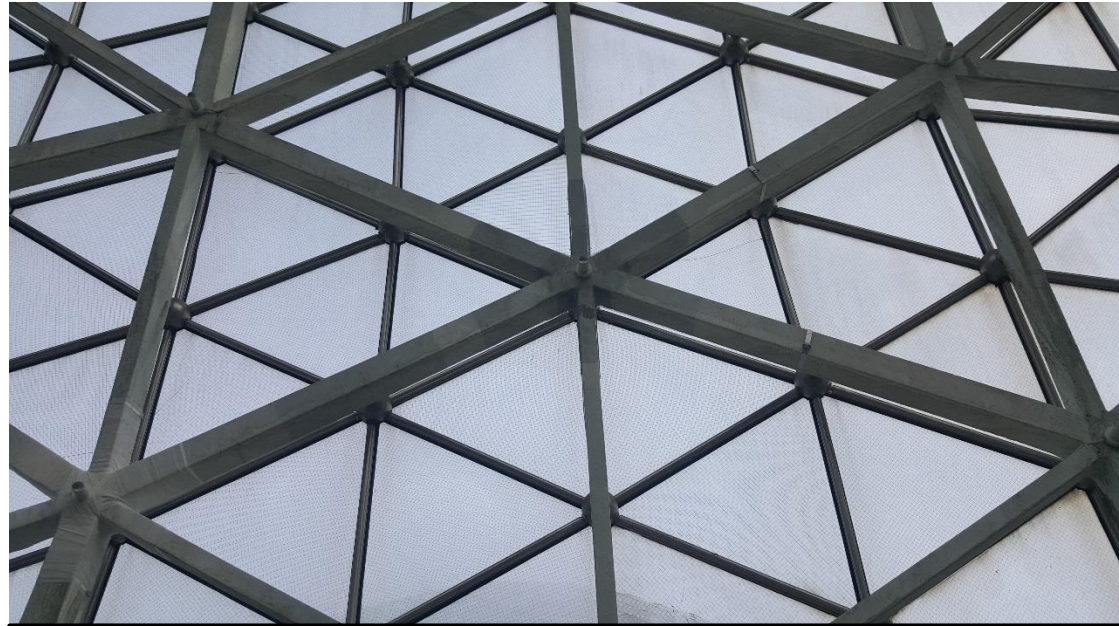


Geodesic Dome Construction





Mitchell Park Domes Construction



Conoidal Domes

- 'Bee hive' shape
- Windows will differ in size
- Mitchell Park Domes built in two layers: concrete structure and separate aluminum window system



Aluminum / Concrete Hub Connection



5,100 Hub
Connections
1,700 Per Dome





Challenges with Domes Design & Use

1. Inability to affordably access interior or exterior above 20'.
 - Exterior typically requires crane for each maintenance action.
 - In 2013, located specialized lift to access Arid & Tropical Dome interiors.
2. ~9,400 Windows
 - Each cut to size when replaced. Very few economies of scale.
 - Due to racking/settling, every piece needs to be verified off site prior to install.
3. ~5,100 Hub Connections (aluminum to concrete frame)
 - Each a point of potential corrosion and spalling due to steel baseplate.
4. Drainage System internal to aluminum framing
 - Clogged throughout structure and virtually inaccessible due to #1 (until new lift identified)
 - Domes constantly dripping inside due to backup in clogged drains.
5. Ensuring plant life maintained throughout repairs
 - Particularly challenging in Arid and Tropical Domes.
 - Must be trimmed back by staff to access interior walls.
6. Structures do not meet ADA accessibility standards and some building codes





Recent Timeline

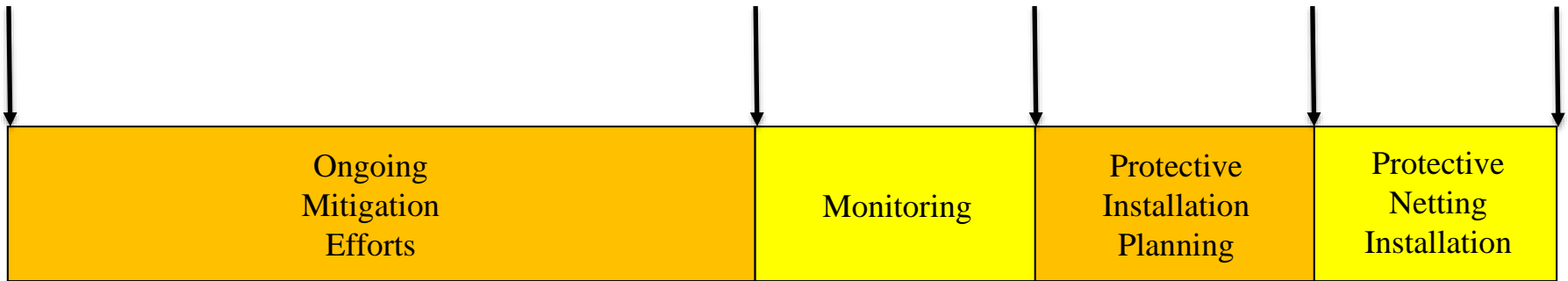
Spalling Concerns Identified via Falling Pieces

Mitigation Efforts Complete

Pieces Found In Soil – Mitigation Effort Debris

Further Pieces Identified – Closure

Domes Re-opened



Ongoing Mitigation Efforts

Monitoring

Protective Installation Planning

Protective Netting Installation

August 2013

January 2015

May 2015

January 2016

Fall 2016





Protective Option: Wire Mesh



- Looked at range of options
 - Up to 5 year life span
- Show Dome and Tropical Dome finished; Desert Dome to be completed next month
- Mesh addresses falling concrete; does not “fix” structures





Protective Option: Wire Mesh





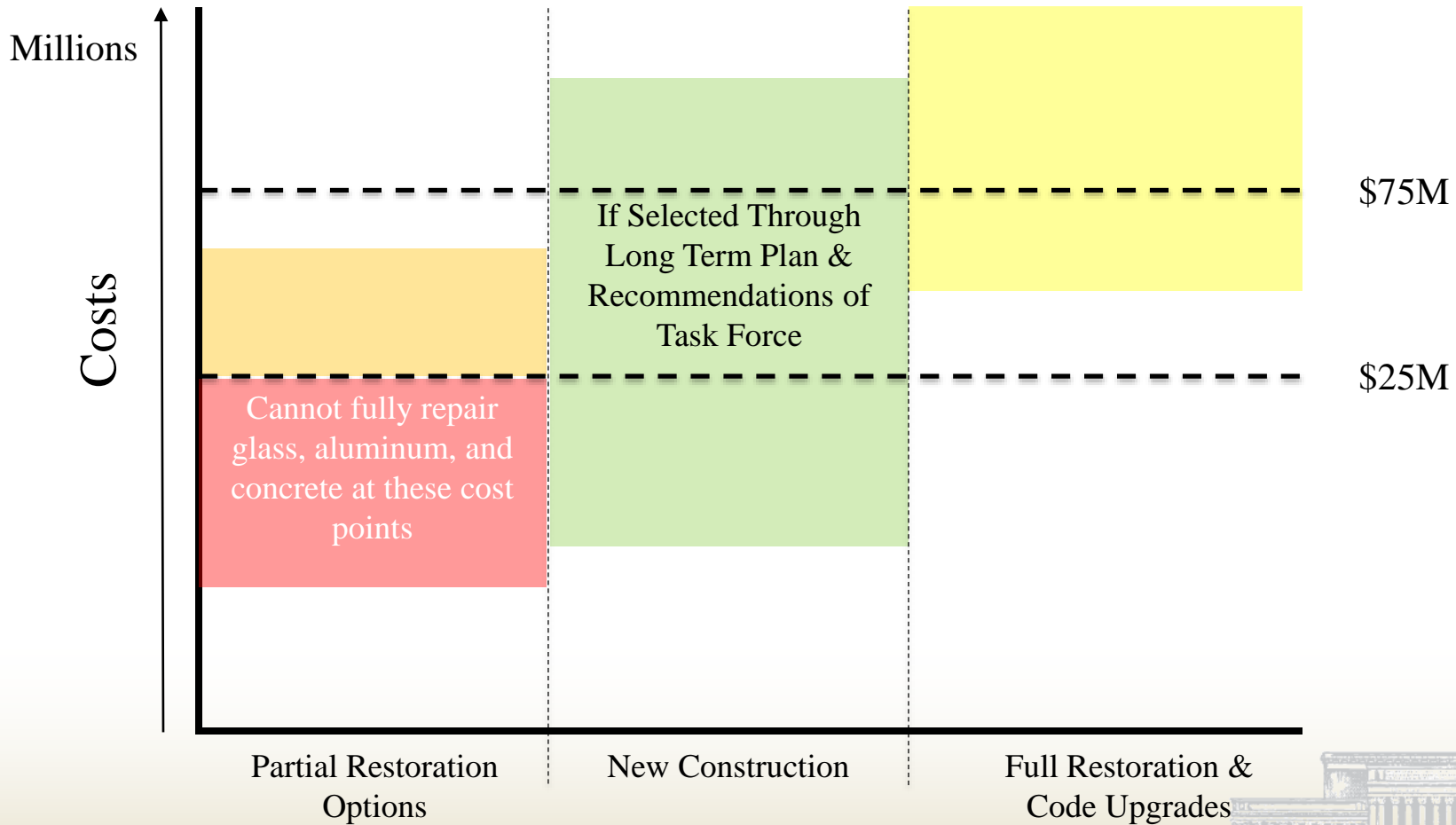
Major Hurdles & Planning Questions

1. What, if any, repair can guarantee no further spalling?
2. Are we willing to leave the wire mesh installed after a major recapitalization effort?
3. Are options required to be cash financed or bondable?
4. How important is an energy efficient window/frame system?
5. How important are perceived deficiencies in programming space?
6. How will the County fund capital costs for future work?
7. How will the County sustain the renovated structure? Do we need a different operating model?





Unique Construction = High Costs





Potential Repair Costs & Options

Studied Various Options, based on 2008 Study of Show Dome

- Option R:
 - Replacement-in-kind
- Options 1 – 4:
 - Substantial upgrades of varying scope
 - Mesh still required due to ongoing issues with existing concrete frames
- Option 5:
 - Remove concrete frame and replace Domes with 21st Century geodesic domes.
- Other Options
 - Build new facility (various configurations) of same size

Complete Report Should Be Ready for Task Force at Next Meeting





Reports, Master Plans, & Studies

Milwaukee County Domes Website

<http://county.milwaukee.gov/Domes>

Link to Reports, Master Plans, & Studies

<http://county.milwaukee.gov/Domes/Condition-Reports-on-the-Domes.htm>



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