

**PROGRESS REPORT #5
CINCINNATI PARKS INFRASTRUCTURE ASSESSMENT
CINCINNATI PARK BOARD
PROJECT NO. 19087**



November 24, 2020

The following report summarizes the progress to date and methodology. A more detailed summary report of the findings is being prepared.

I. INTRODUCTION

This study assessed the Cincinnati Park Board park system's facilities and infrastructure to determine capital improvement needs, priorities, and costs. The study results will drive future capital improvement budgets and provide the levels of need and urgency for repairs, renovations, and replacements. The CPB has an aging system and facilities which host large numbers of users. Therefore, it is critical to perform this assessment to get a firm handle on the expanse of the capital needs to bring the system up to current standards for safety and to avoid further deterioration.

THE PROJECT TEAM:

The following firms were part of the Assessment Team

- **Brandstetter Carroll Inc** – Prime consultant and assessment of roads, parking, curbs, slide areas, and concrete ponds.
- **Human Nature Inc.** – Site assessments of walks, playgrounds, site furniture and amenities, plazas, and more. Also in the updating of costs from the 2007 Centennial Master Plan.
- **GOP Limited** – Structural Engineering assessment of walls and structures.
- **E2M Engineering Inc.** – Assessment of mechanical, electrical, and plumbing engineering for structures, sites, and site lighting.
- **TEC Engineering Inc.**– Calculation of areas for roads, parking lots, walks, steps, and plazas.
- **Brownstone Design Inc.** – Will prepare the final report graphics.

II. THE ASSESSMENT PROCESS

INITIAL COORDINATION MEETING - The process began with a coordination meeting of the BCI Team and CPB Staff to discuss specific issues to be assessed as part of the process.

PREVIOUS STUDY REVIEW - The Team then reviewed previous studies and information provided by the CPB staff prior to performing the assessments.

- a. 2007 Centennial Master Plan
- b. Previous Capital Improvement Plans
- c. 2002 Park Structures Assessment
- d. Infrastructure records and needs
- e. ADA facility and site assessments by the ADA Transition Team
- f. Individual park and facility master plans to update and determine costs for:
 - 1) Krohn Conservatory renovations and additions
 - 2) Nature Center upgrades

GIS MAPPING

Sites were mapped to illustrate GIS information available, such as the property boundaries, structures, walls, walks, roads, parking, fences, and some limited utility information available through GIS and provided by CAGIS. A GIS map was prepared to illustrate the current CPB parks and parks by others to assist the Team in locating the parks to be assessed.

GIS, Google Earth, and other methods were used to estimate the surface area of roads, parking lots, plazas, and walkways prior to field visits.

CPB ARCHIVES REVIEW

The Team spent two days in the CPB archives searching for floor plans, construction drawings, and utility plans to assist in the effort.

FACILITIES INVENTORY

The Team prepared a detailed spreadsheet of the sites and facilities provided at each site that needed to be assessed. Sites with no facilities or that were operated by the Cincinnati Recreation Commission or Great Parks of Hamilton County were omitted from the assessment list.

SITE AND STRUCTURE ASSESSMENT VISITS

- A. One group assessed the roads, parking lots, and curbs.
- B. Another group assessed the playgrounds, walks, site furniture, ADA access to facilities, and other site elements.
- C. Another group assessed the structures, including comfort stations, pavilions, shelters, nature centers, offices, lodges, and more.
- D. Another group assessed the concrete ponds.
- E. An aquatic engineer analyzed the fountains.
- F. These Advance Teams identified problem areas that needed further analysis by the Structural Engineers (walls and structures), Aquatic Engineers (for fountains), and Mechanical, Electrical, and Plumbing (MEP) Engineers. These included park lighting, plumbing, and electrical issues in specific structures, retaining walls, the fountains and water features, and areas known for potential slides.

FACILITY QUALITATIVE ASSESSMENT CHECKLISTS were prepared by each discipline as part of an interdisciplinary team at each site.

- A. Aspects that were inventoried and evaluated on the Qualitative Assessment Forms included:
 1. ADA compliance of structures and site
 2. Structures:
 - a. Size and conditions by room
 - b. Structural condition
 - c. HVAC
 - d. MEP conditions
 - e. Roof
 - f. Walls, floors, and ceiling
 - g. Interior surfaces
 - h. Circulation
 - i. Security
 - j. Utilities
 - k. ADA
 3. Site:
 - a. Parking and access – roads and curb
 - b. Security
 - c. Lighting and electric power
 - d. Utilities
 - e. Stormwater system condition
 - f. Retaining walls
 - g. Walkways and stairs

- h. Site furnishings
- i. Concrete lined ponds
- j. Playgrounds and surfacing
- k. Land management (erosion control and hillside management)
- l. Signage and wayfinding

- B. STANDARD UNIT PRICES** – Following the assessments, the Team prepared a list of the most common improvement costs to be used in the cost estimating process.
- C. FACILITY CONDITION RATING** - The Team used the forms to document the condition, cost to repair, and priority level for each of the above. The cost to improve each issue was prepared. The forms used the following categories to identify inventoried items:
- **Excellent** – New / well maintained condition; no improvements anticipated within ten years
 - **Good** – Minor wear; minimal improvements needed; should be re-evaluated after five years
 - **Fair** – Significant wear / damage; needs repair; should be repaired or replaced within 3-5 years; asset functions now but is near the end of its life cycle.
 - **Poor** – Needs replacement or renovation; should be repaired or replaced within the next two years; reasons for this ranking include:
 - Unsafe conditions
 - Threat of further deterioration
 - Lacking in ADA Accessibility
 - Unsightly condition
 - Replacement parts not available
- D. PHOTOGRAPHS** - Photographic analysis was used to document the conditions of each facility.
- E. COMBINED ASSESSMENT FORMS** - BCI consolidated the various evaluations into a separate Excel spreadsheet for each park (with tabs for the various disciplines). For larger sites, tabs are included for individual areas. A separate form was completed for each structure.
- F. COST ESTIMATES** - These evaluation forms provided the foundation for a comprehensive spreadsheet identifying the costs for each type of facility. This table is sortable by facility type, condition level, and park. Most costs are based on the cost of upgrading to current standards. In the case of underground utilities where the condition could not be determined without use of video cameras in the pipes, overall replacement cost was ascertained using type and size of the existing utilities. The Civil Engineers typically recommend municipalities use the cost of the new infrastructure divided by a 50-year life to budget for annual utilities replacement. Due to the age of the CBP system, the estimates prepared include 15% of the replacement cost for those items to be replaced or repaired over the next ten years.
- G. FAIR AND POOR CONDITION ITEMS** - The Team also prepared a spreadsheet to highlight the items that were identified as "Fair" or "Poor" with the replacement/improvement values for each.
- H. 2007 CENTENNIAL MASTER PLAN UPDATE COSTS** – The Team met with CPB staff to discuss the recommendations from the 2007 Centennial Master Plan to identify the improvements that have been accomplished and those that still need to be implemented. Additional improvements desired by CPB but not outlined in the 2007 Plan were also identified. These additional costs are currently being updated.

III. FINDINGS AND COST SUMMARY

OVERALL FINDINGS

The current cost to improve existing infrastructure is estimated at **\$60,820,827**. This includes over **\$22 million** in the "**Fair Condition**" category and over **\$11 million** in the "**Poor Condition**" category, meaning this is the amount needed to bring existing facilities up to a safe and functional state or to avoid further deterioration.

Overall, the Team's analysis finds that those facilities used for their intended purposes are in very good condition. However, there are significant issues with those facilities which are no longer used and are not maintained. For example, Inwood Pavilion is over 100 years old and a former pool bathhouse and pavilion. Since the removal of the pool a function and use for the space has not been determined. As a result, the facility has fallen into disrepair to the point that it will take significant renovation to save the historic structure. As another example, former concession stands that are now used for storage have considerable structural degradation.

ANNUAL BUDGET ITEMS

In addition to the infrastructure needs identified by the Team for this report, the following amounts are recommended to be budgeted annually to cover anticipated costs based on expenses CPB has historically incurred.

- | | |
|---------------------------------|-----------|
| • Fountains and Water Features | \$250,000 |
| • Emergency Utility Maintenance | \$150,000 |
| • Emergency Damage / Vandalism | \$150,000 |

METHODS AND FINDINGS

A. ROADS, CURBS, AND PARKING

TEC Engineering performed a review of CAGIS, Google Earth, and other sources to identify the quantities of various types of pavement, including for roads, parking lots, walks, steps, and plazas. The BCI Team supplemented this data with scans of site plans from the CPB archives and charts from CPB. Maps of each park were prepared and used for field inspections. Notes were taken in the field as well as photographs. In some cases, Google aerial mapping and Google Street View images were reviewed after the field investigations were completed.

These surfaces were ranked as Excellent, Good, Fair, or Poor. Unit price data came primarily from local municipal paving programs and were used to estimate the cost of the appropriate necessary work. This method has been used successfully by BCI for many years to plan annual street paving programs and to apply for grants where appropriate.

The costs included on the assessment forms are for those elements rated as "fair" or "poor" and which will need either replacement or repairs in the next few years. The provided tables include the quantities of all roads and parking lot areas.

B. UTILITIES

The utility data collection primarily included length, diameter, material type, and age using a combination of CPB's records and available CAGIS data. In some cases, the age is estimated from building permit records. For parks that have one facility on site and no available mapping CAGIS records were used to estimate the length of the water service and sewer lateral. The extent of the services was estimated using the facility's use and size.

The quality and condition of the utilities is difficult to identify without testing and the use of cameras in the pipes, methods that were beyond the scope of this assignment. Also taken under consideration is the fact most utility lines have a 50-year life span - many of the CPB parks are well over that 50 year limit. Typical construction unit pricing was used to calculate total replacement cost. A cost equal to 15% of the total replacement cost was added for areas which may need repairs or replacement over

the next ten years. Parks that are newer or have had utilities replaced were omitted from the formula (e.g., Westwood Town Hall, Washington Park, and Smale Riverfront Park).

It should be noted that age is not the primary factor for determining when an underground utility should be replaced. Pipe material dating as far back as the 1920's and 1930's is often higher quality than post WW II materials and workmanship. Additional factors to consider include ground conditions, soil type, and vegetative growth above the utility.

Past performance is a good indicator of need. This makes it critical that CPB personnel maintain accurate repair and replacement records, including the type of failure. For example, a longitudinal failure along the crown of a pipe has different causes than failures at a joint. Whenever major reconstruction or new paving takes place in a given park, video inspections of underground pipe should be conducted. Experience has shown that an underground utility replacement is 25-30% less expensive if completed in conjunction with a paving project.

C. CONCRETE PONDS

The CPB system has four concrete ponds. Two are at Eden Park and one each at Inwood Park, and Rapid Run Park. The pond at Burnet Woods has a natural bottom. The BCI Team reviewed each pond in the field. The general observation is that wall repairs are needed now and periodically moving forward, as well as regular caulking of the joints.

To estimate the number of joints, BCI determined the number and length of joints using CPB archive drawings, Google Earth images, or CAGIS mapping for Rapid Run Park. Because it is under the jurisdiction of Cincinnati Waterworks, a cost for Mirror Lake was not identified. Based upon the area of the ponds, the Team calculated a linear foot of joint per square foot of concrete area and identified a linear foot of side wall. BCI successfully uses this method to determine the footage of cracks in asphalt and concrete pavement on large areas such as airport aprons, taxiways, and runways.

Typical repair unit price data was applied to these quantities.

D. SLIDE AREAS

The BCI Civil Team completed site visits at five parks selected by CPB Staff::

- Fairview Park
- Burnet Woods
- Eden Park
- Hill Street Park
- Theodore Berry International Friendship Park
- Mt. Storm Park

At each site the length of the apparent slide area was measured and to the extent possible the downslope condition was also reviewed to obtain a better idea as to the type and depth of the slope failure. Except for Friendship Park, each is generally typical of the type of slope failures in southwest Ohio encountered along the Ohio River valley.

Using recent unit costs from other similar BCI projects an average linear foot cost was determined for a drilled pier wall with concrete plug piers.

The previous project at Friendship Park was extensive. The Team's understanding is that these are tie back walls the cost of which may vary significantly.

In summary, lacking more detailed geotechnical information and engineering analysis, the estimates included for these projects is an order-of-magnitude estimate.

E. WALLS

All walls identified in CAGIS and those identified by CPB Staff were visited in the field by a Structural Engineer and rated on the assessment forms. All walls with a "fair" or "poor" rating have an associated cost. Walls needing immediate attention include some at Eden, Inwood, Jackson Hill, and

Mt. Airy Forest. Walls needing to be planned for repairs (rated "fair") are found at Alms, Bettman, Eden, Fleischmann, Hoffner, and Theo Berry International Friendship Park.

F. STRUCTURES

A collaborative approach was used on the structures. The Advance Team included an architect or construction administrator together with a staff person from CPB who could access locked areas and provide insight of known conditions. The Team documented external conditions (roof, walls, windows, doors, etc.) and size, materials, and condition of each room in buildings with multiple rooms. Where conditions warranted, a follow-up visit by the Structural and MEP Engineers allowed expanded documentation of the conditions and systems.

The Structural and MEP Engineers documented the condition and cost for each improvement required. The Architects and Construction Administrators documented the conditions but gave the structure an overall condition rating. They also applied a square foot cost (using the Unit Cost Table) for the entire structure rather than the individual elements. Costs are based upon the extent of the repairs required.

G. SITE FURNITURE, WALKS, STEPS, FENCES, PLAYGROUNDS, SWINGS, AND PLAY SURFACES

This group included Landscape Architects from Human Nature and Brandstetter Carroll Inc. who visited every site to document the conditions of site elements. Using digital sources, TEC Engineering identified and quantified the amount of steps, walks, fences/railings prior to site visits. Qualitative assessment was then performed on site. All facilities were documented, rated, and costs assigned. The previously-conducted ADA assessment was reviewed to determine known conditions and deficiencies.

To ensure ADA accessibility, in places where walks to various features exceeded a 5% slope or 2% cross slope the amount of walk needed to be improved or added was identified and included in the cost.

These costs are identified on the Assessment forms.

SUMMARY COSTS

The table on the following page summarizes the anticipated costs by project type.

STUDY LIMITATIONS

- A. This project does not include the more than 65 miles of trails in the system because CPB Staff will assess those facilities.
- B. Also, this project does not include forest/landscape improvements or natural resource management recommendations.
- C. Utility information was based upon existing GIS mapping provided through CAGIS, as well as a review of scanned site plans from the CPB archives. Some of the GIS mapping for utilities was limited to the public right-of-way. In these instances, the scanned site plans were searched. If none were available, the team estimated the age based on the date of the park and surrounding neighborhood development.
- D. The costs represented in this analysis are for improvements to existing infrastructure. The cost of implementing the recommendations from the 2007 Centennial Master Plan and other planned improvements are in the process of being updated. The Master Plan Update will address these implementation costs plus costs associated with the ongoing Equity Analysis being performed by CPB Staff.

PARK FACILITIES- FUNDING REQUIRED BY IMPROVEMENT TYPE

**Cincinnati Park Board
Infrastructure Assessment
Brandstetter Carroll Inc.
November 24, 2020**

BUILDINGS	
Pavilions	\$3,288,175
Lodges	\$1,944,390
Comfort Stations	\$865,880
Shelters	\$250,530
Former Caretaker Houses	\$13,000
Service Buildings	\$1,987,300
Offices	\$1,683,600
Concession Buildings	\$176,970
Nature Centers	\$1,169,455
Additional Buildings	\$3,185,325
Greenhouses	\$9,440,750
CIRCULATION	
Roads	\$7,417,852
Parking	\$1,849,261
Curbs	\$145,750
Paved Pads/Plazas	\$3,065,738
Walks/Steps	\$2,075,117
STRUCTURES	
Retaining Walls	\$3,560,750
Other Structures / Fountains	\$5,745,200
Slide Areas	\$2,920,000

PLAYGROUNDS	
Play Sets	\$3,091,000
Play Surfaces	\$1,215,044
Swings	\$429,783
Site Furnishings	\$981,200
UTILITIES	
Storm Systems	\$2,300,455
Sanitary Systems	\$190,409
Water Systems	\$1,246,414
Site Lighting	\$581,480
Sub-Total	\$60,820,827
10% Contingency	\$6,082,083
CONSTRUCTION SUB-TOTAL	
	\$66,902,910
12% Design and Engineering	\$8,028,349
TOTAL	
	\$74,931,259
ANNUAL BUDGET COSTS	
Fountains & Water Features	\$250,000
Emergency Utilities Maintenance	\$150,000
Emergency Damage/Vandalism	\$150,000

STRUCTURES



1. Inwood Pavilion decaying exterior



2. Inwood Pavilion decaying interior



3. Owls Nest Pavilion exterior



4. Owls Nest Pavilion interior



5. Mt. Airy Area 23 shelter



6. Mt. Airy Comfort Station closed for 30 years



7. Lichens and insect damage at Ault Pergolas



8. Burnet Woods concession used for storage



9. Eden Twin Lakes concession used for storage



10. Eden Twin Lakes used for storage



11. Cracked post at Eden Park



12. Cracked walls at Eden HQ Building



13. California Woods sagging roof on shelter



14. California Woods Schoolhouse roof



15. Seasongood Square CS interior damage



16. Seasongood Sq. CS rusted door frame



17. Wulsin unused former comfort station



18. Stella Shelter rusting posts



19. Fairview Shelter roof damage



20. Planning Office wet carpet damage



21. Mt. Echo CS ceiling damage



22. Mt. Echo shelter roof damage



23. Warder Greenhouse single pane glass



24. Ault Cascade delaminating sandstone

PAVEMENT



1. Eden Twin Lakes crosswalk pavers



2. Eden Twin Lakes crosswalk



3. Alms Park deteriorating pavement



4. Avon Woods pavement



5. Mt. Echo poor pavement



6. Hauck Gardens deteriorated pavement



7. Wall, walk, and paving at Eden Park



8. Eden Park damaged curb



9. Sawyer Point deteriorated asphalt



10. Glenway Park stairs with no railing



11. French Park cracked sidewalks



12. Kennedy Heights uneven sidewalk



13. Kennedy Heights steps with no railing



14. Kennedy Heights shaky footbridge



15. Mayfield steps with no handrails



16. McEvoy cracked concrete



17. Mt. Airy Area 13 uneven sidewalks



18. Arboretum damaged sidewalk

PLAYGROUNDS & SITE FURNISHINGS



1. Inwood tables



2. Jackson Hill rusted swings



3. Jackson Hill worn picnic tables



4. Mayfield dented slides



5. Mayfield inaccessible drinking fountain



6. Stella Park damaged playground



7. McEvoy uneven safety surface



8. Maple Ridge worn play equipment



9. Mt. Airy Treehouse dead tree



10. Mt. Airy Treehouse uneven surfaces



11. Cracked light post at Alms Park



12. Rusted light post at Burnet Woods