



LANDSCAPE PERFORMANCE SERIES

Carmel Clay Central Park – Carmel, IN Methodology for Landscape Performance Benefits

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Environmental

Diverts 11.9 million gallons of stormwater runoff annually from the Monon Community Center roofs and parking areas into bioswales, fields and the wetland instead of catching and piping the runoff into the municipal storm sewer.

Parking areas are built without catch basins and pipe culvers to collect runoff. Instead, stormwater flows from the parking areas through curb cutouts and into drainage swales or across vegetated open ground, allowing the water to infiltrate into the soil and any remaining water flows into the wetland. Summarily, the roof surfaces of the Monon Center drain from downspouts into bioswales before entering the wetland. The lagoon is part of the wetland system, increasing storage capacity and fosters interaction with biological processes that help breakdown impurities. Ultimately any runoff that passes through the wetland will flow into Carmel Creek bypassing the need for traditional subsurface infrastructure.

Actual as-built impervious surfaces total 10.2 acres (Source: Google Earth). Carmel receives an average annual rainfall of 42.85 inches (Source: USGS.org). Assuming no evaporation or other loss of water as the stormwater travels from the parking areas to a hypothetical catch basin the following calculation estimates the total runoff.

$$\begin{aligned}(42.85 \text{ inches} / 12 \text{ inches per foot}) &= 3.57 \text{ feet} \\ 3.57 \text{ feet} * 10.2 \text{ acres} &= 36.41 \text{ acre-feet} \\ 36.41 \text{ acre-feet} / 325,851 \text{ gallons per acre-foot} &= \mathbf{11.9 \text{ million gallons}}\end{aligned}$$

Treats 2,271,000 gallons of greywater from the water park using the constructed lagoon and wetland, saving \$8,539 in sewer charges annually.

Through the 2012 summer season, operators refreshed a total of 2,271,000 gallons of water for the water park, diverting the greywater to the wetland and lagoon where solar exposure and other natural processes break down chlorine.

In 2012 commercial sewer rate for the City of Carmel is \$3.76 per 1,000 gallons. Total savings in sewer charge is $(2,271,000 / 1,000) * \$3.76 = \mathbf{\$8,539}$.

Source

Assistant Director of Carmel Clay Parks and Recreation; electronic correspondence June 20, 2013
City of Carmel 2012 sewer rates, <http://www.carmel.in.gov/index.aspx?page=232>

Social

Served over 590,000 visitors to the Monon Community Center in 2012.

The Carmel Clay Parks and Recreation 2012 *Annual Report* lists 591,296 in total membership and pass attendance for the Monon Community Center. Actual park use is likely higher as visitors can freely enter the park and use the passive areas without being counted. Unfortunately there is no reliable method to account for all park visitors.

Educated and/or entertained 1,298 participants between 2012 and 2013 through 10 youth programs, summer camp and 4 adult outdoor educational and recreational programs using the parks' wetland, woods, waters and open areas.

The table below lists the name and number of participants in outdoor educational and recreational programs offered at the park. The 2012 programs drew 533 participants and the 2013 programs have drawn 765 participants for a total of 1,298.

Program Name	2012 Participants	2013 Participants
Youth Programs		
Senses in Nature	4	Not offered
Knee-High Naturalists	103	131
Mom & Me Outdoors	80	106
Frogs, Toads, Salamanders	10	25
Fuzzy, Fuzzy Critters	Not offered	16
Beetles, Bugs & Butterflies	8	17
Birds & Binoculars	Not offered	8
Life in the Pond	Not offered	16
Through a Microscope	Not offered	15
Biking Club	Not offered	6
Summer Camp – Outdoor Explorers	308	398
Adult Programs		
Indiana Master Naturalist	6	12
Free Fishing Weekend	5	Canceled
Gardening in the Wildlife	Not offered	5
On the Trail to Fitness	9	10
Totals	533	765

Source

Program numbers as reported by the Recreation Manager of Carmel Clay Parks and Recreation; interviewed July 4, 2013.

Creates 16 miles of continuous bike trails for the city of Carmel by linking the 5.2-miles of the regional Monon trail to 6.8-miles of neighborhood trails with 4 miles of trails within the park.

The 5.2-mile segment of the 10.4-mile-long Monon Trail is located in Carmel and bisects Central Park. The Park's 4-mile internal trail system connects the Monon Trail to the 6.8-mile City Center Loop trail and thus makes a continuous 12-mile bike route.

Source

Government of Hamilton County Indiana Maps, Aerial Photos & GIS website;
http://gis.hamiltoncounty.in.gov/FlexViewer_Parks_Trails/Index.html

Economic

Generated over \$560,000 in net revenues in 2012 from visitors' fees for ticketed areas of the park, offsetting the cost of maintaining the entire 161-acre park.

Carmel Clay Parks and Recreation *2012 Annual Report* lists \$5,078,712 in total revenue generated by the Monon Community Center (including the waterpark ticket sales). The total Monon Community Center operating expenditure was \$4,511,040 leaving \$567,672 (\$5,078,712 - \$4,511,040) to offset the cost of maintaining the passive areas of the park.

**Increased the Carmel Clay Parks and Recreation seasonal full-time staff from 7 to 60 positions—
positions that are financially sustainable for the foreseeable future.**

Personnel numbers as furnished by the Director of Carmel Clay Parks and Recreation; interviewed May 10, 2013.

Saves \$56,000 in annual maintenance costs by introducing native plant species in open areas instead of turf.

In 2012, annual turf maintenance costs for Carmel Clay Parks and Recreation was \$1,400 per acre while maintenance costs of prairie/natural areas were \$50 annually per acre. The park has approximately 55 acres of open area with 15 acres of turf and 40 acres of prairie/natural plants. By choosing prairie/native plants instead of traditional turf the park saves \$56,000 annually (40 acres x \$1,400/acre = \$56,000).

Source

Director of Carmel Clay Parks and Recreation; interviewed July 4, 2013.

Cost Comparison Methodology

The park has approximately 55 acres of open area with 15 acres of turf and 40 acres of prairie/natural plants. By choosing prairie/native plants instead of traditional turf for 40 acres, the park saves \$56,000 in annual maintenance costs.

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Source

Director of Carmel Clay Parks and Recreation; interviewed July 4, 2013.

Additional Research

Additional research could be pursued to determine the effect Central Park has on neighboring property values. The hypothesis we attempted to prove was that the park helped decrease volatility and stabilize property values in close proximity to the park during the recent economic recession between the years of 2007 to 2012. However, it seems the change in property values throughout Carmel during this period were about the same, on average, regardless of the proximity to Central Park. Carmel is an affluent community with several public parks distributed across the community and as such the effect of Central Park is difficult to isolate.

Our methodology analyzed residential real estate values assessed between 2007 and 2012 for properties (including both land and structures) immediately adjacent to Central Park and for properties randomly selected throughout Carmel. Data is publically available from an online GIS database provided by the Hamilton County Assessor's Office. A random sampling of property values (every third assessment) shows an average 6% drop in values around Central park. This is not remarkable noting that the average drop in values from 3 subdivisions located 0.7 to 2.58 miles from the park was roughly the same, -7.3%. The following tables list the property values included in this comparison.

Property values neighboring Central Park.

Property Location	2007/2008 Value (\$)	2012 Value (\$)	Differential (\$)
North of Park	149900	167200	17,300
North of Park	181500	193400	11,900
North of Park	215300	207200	(8,100)
North of Park	230800	205000	(25,800)
North of Park	264600	261100	(3,500)
North of Park	233700	233800	100
North of Park	250100	221600	(28,500)
North of Park	264100	243000	(21,100)
North of Park	270500	239600	(30,900)
North of Park	216700	217600	900
North of Park	248800	228700	(20,100)
North of Park	214100	231800	17,700
North of Park	198900	202500	3,600
North of Park	228000	230700	2,700
North of Park	218100	223100	5,000
West of Park	151200	156100	4,900
West of Park	145900	100600	(45,300)
West of Park	186400	180500	(5,900)
South of Park	165100	127600	(37,500)
South of Park	107300	89500	(17,800)
South of Park	47700	51400	3,700
South of Park	120000	84400	(35,600)
South of Park	143400	152900	9,500
South of Park	195800	192500	(3,300)
South of Park	161100	169100	8,000
South of Park	121800	108700	(13,100)
East of Park	263600	201500	(62,100)
East of Park	184200	182600	(1,600)
East of Park	131000	131200	200
East of Park	319800	297900	(21,900)
East of Park	51300	49400	(1,900)
East of Park	194200	163600	(30,600)
East of Park	311500	255400	(56,100)
Average =	193527	181855	(11673)

Percent Change =	$(-11673 / 193527) * 100 = -6.03\%$
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Property values from Meridian subdivision, 0.7 mile west of Central Park.

Property Address	2007 Value (\$)	2012 Value (\$)	Differential (\$)
49th 111th st w	142200	131000	(11,200)
50 Mersey Ct	163400	140200	(23,200)
51 Mersey Ct	152500	132500	(20,000)
11006 Tottenham Dr	146200	127300	(18,900)
11022 Tottanham Dr	150700	133100	(17,600)
10930 Tottanham Dr	166500	156400	(10,100)
10916 Tottanham Dr	131300	120400	(10,900)
52 Manchester Ct	173200	142200	(31,000)
43 Manchester Ct	135700	126500	(9,200)
10901 Tottenham Dr	134500	122400	(12,100)
10921 Tottenham Dr	127300	128100	800
10941 Tottenham Dr	170100	137900	(32,200)
11005 Tottenham Dr	137500	124900	(12,600)
11025 Tottenham Dr	137600	124100	(13,500)
Average =	147764	131929	(15,836)
Percent Change =	$(-15836 / 147764) * 100 = -10.72\%$		

Property values from Blue Creek Woods Estates, 1.8 miles southeast of Central Park.

Parcel Number	2007 Value (\$)	2012 Value (\$)	Differential (\$)
16 14 08 02 01 068 000	199100	210900	11,800
16 14 08 02 01 066 000	256200	257800	1,600
16 14 08 02 01 063 000	221300	201800	(19,500)
16 14 08 02 01 060 000	256700	252800	(3,900)
16 14 08 02 01 057 000	255500	251900	(3,600)
16 14 08 02 01 054 000	248200	255800	7,600
16 14 08 02 01 051 000	265700	265400	(300)
16 14 08 02 01 035 000	259400	272000	12,600
16 14 08 02 03 002 000	262200	238600	(23,600)
16 14 08 02 01 028 000	287100	269300	(17,800)
16 14 08 02 01 026 000	265100	260900	(4,200)
16 14 08 02 01 023 000	231900	234800	2,900
16 14 08 02 01 020 000	220000	231700	11,700
16 14 08 02 01 017 000	299100	289700	(9,400)
16 14 08 02 01 013 000	216700	218300	1,600

16 14 08 02 01 044 000	278000	275100	(2,900)
16 14 08 02 01 047 000	255300	255700	400
16 14 08 02 01 042 000	268300	267300	(1,000)
16 14 08 02 01 039 000	198800	214300	15,500
16 14 08 02 01 034 000	260300	261700	1,400
16 14 08 02 01 001 000	267900	269800	1,900
16 14 08 02 01 004 000	218100	226000	7,900
16 14 08 02 01 007 000	238100	235400	(2,700)
16 14 08 02 01 010 000	289000	282700	(6,300)
Average =	251964	249529	(793)
Percent Change =	$(-763 / 251964) * 100 = -0.30\%$		

Property values from Park Meadows subdivision, 2.58 miles southwest of Central Park.

Parcel Number	2007 Value (\$)	2012 Value (\$)	Differential (\$)
16 09 26 00 06 053 000	201300	193700	(7,600)
16 09 26 00 06 050 000	197100	189800	(7,300)
16 09 26 00 07 001 000	222300	219400	(2,900)
16 09 26 00 07 004 000	230300	222300	(8,000)
16 09 26 00 07 007 000	252900	242500	(10,400)
16 09 26 00 07 010 000	215000	201700	(13,300)
16 09 26 00 07 013 000	232500	225500	(7,000)
16 09 26 00 07 016 000	243400	229800	(13,600)
16 09 26 00 07 019 000	227700	219300	(8,400)
16 09 26 00 07 022 000	226400	218500	(7,900)
16 09 26 00 04 009 000	220600	230300	9,700
16 09 26 00 04 006 000	188900	180900	(8,000)
16 09 26 00 04 003 000	186800	177100	(9,700)
16 09 26 00 04 011 000	230100	220700	(9,400)
16 09 26 00 04 014 000	209200	201900	(7,300)
16 09 26 00 04 017 000	222200	208800	(13,400)
16 09 26 00 04 020 000	232000	225200	(6,800)
16 09 26 00 04 023 000	217100	205200	(11,900)
16 09 26 00 04 026 000	214300	199200	(15,100)
16 09 26 00 04 029 000	206400	203000	(3,400)
16 09 26 00 04 033 000	197500	189300	(8,200)
16 09 26 00 04 035 000	238500	228900	(9,600)
16 09 26 00 04 038 000	201400	190200	(11,200)
16 09 26 00 04 041 000	181900	177700	(4,200)
16 09 26 00 04 044 000	170400	172200	1,800
16 09 26 00 06 024 000	234200	233500	(700)
16 09 26 00 06 021 000	243000	239100	(3,900)

16 09 26 00 06 018 000	270100	254200	(15,900)
16 09 26 00 06 015 000	257500	245400	(12,100)
16 09 26 00 06 012 000	217200	204000	(13,200)
16 09 26 00 06 009 000	238200	227500	(10,700)
16 09 26 00 06 006 000	213200	205000	(8,200)
16 09 26 00 06 003 000	266700	251500	(15,200)
16 09 26 00 06 034 000	239300	232300	(7,000)
16 09 26 00 06 031 000	217100	210600	(6,500)
16 09 26 00 06 028 000	209900	207800	(2,100)
16 09 26 00 06 025 000	220100	214000	(6,100)
16 09 26 00 04 049 000	239200	224000	(15,200)
16 09 26 00 04 052 000	245500	233100	(12,400)
16 09 26 00 04 055 000	202400	190100	(12,300)
16 09 26 00 07 048 000	279700	265400	(14,300)
16 09 26 00 07 045 000	204900	196900	(8,000)
16 09 26 00 07 042 000	212800	201100	(11,700)
16 09 26 00 07 039 000	220200	211800	(8,400)
16 09 26 00 07 036 000	214400	210000	(4,400)
16 09 26 00 07 033 000	227600	219600	(8,000)
16 09 26 00 07 030 000	193000	186700	(6,300)
16 09 26 00 07 027 000	193100	186600	(6,500)
16 09 26 00 07 024 000	240100	227300	(12,800)
Average =	219664	212250	(8469)
Percent Change =	$(-8469 / 219664) * 100 = -3.86\%$		

Subdivision Name	Average change in value	Average
Meridian	-10.72%	7.29%
Blue Creek Woods Estates	-0.30%	
Park Meadows	-3.86%	

Source

<http://www.hamiltoncounty.in.gov>, accessed 10:00AM CT, 06/04/2013.

<http://us.spindices.com/index-family/real-estate/sp-case-shiller> accessed 4:00PM CT, 07/18/2013, S&P/Case-Shiller Home Price Indices 2011 Year in Review, March 2012.