Fee Study for
Fee In Lieu of Stormwater Detention

The City of Springfield first adopted ordinances in the early 80's to begin requiring stormwater detention on new developments to protect properties downstream from flooding. However, there are certain instances, such as when a site is adjacent to the floodplain, where onsite stormwater detention provides little to no benefit downstream and could even make matters worse. There are also cases where the development project is very small (for example a 2,000 square foot building addition), the impact downstream is negligible, and the design and construction of detention isn't practical. Therefore, in the mid-90's Springfield included a fee in lieu of detention. Based on discussions with the former Principal Stormwater Engineer and the Public Works Director at that time, the fee structure was originally created to be roughly equivalent of the cost to design and construct onsite detention. Section 96-16 of City Code establishes this fee structure (see Table 1 below) and authorizes the Director of Public Works to amend it based on the annual percentage change in construction cost using the construction price index. However, since it hasn't been revised since 2001 (about twenty years), a more thorough evaluation is warranted.

Volume of Detention (cf)	1 or 2 Family Residential	Other Land Uses
0 – 24,000	$1 per cf	$2.00 per cf
24,001 – 100,000	$0.50 per cf	$1.00 per cf
> 100,000	$0.50 per cf	$0.50 per cf

Table 1: Fee Structure from Section 96-16

To evaluate the fee, 12 projects completed within the last 6 years, were selected for analysis. These projects ranged from residential to commercial and varied in size from less than one acre up to 49 acres. A table is included in the appendix with more detailed information about the projects. Costs for design and construction were obtained directly from engineers and contractors associated with each project and the fee in lieu of detention was calculated based on the current fee structure and then compared to the actual costs. Several graphs are included on the following pages showing the results of this analysis. At this time only one single-family residential project has been evaluated due to the limited number of residential single-family subdivisions developed within the City limits in recent years. Given the limited data, no change is proposed for the rate for the "One or Two Family Residential" category.

Figure 1 is a bar chart comparing the actual costs to the "fee in lieu of" for each project. Of the 12 projects, 7 showed the "fee in lieu of" cost below the actual cost to design and construct the basin. It's also worth noting that 4 of the sites elected to use an underground detention system which drastically increases the cost but may allow for more use of the site. Some have suggested that land value should be considered

in the “fee in lieu of” rate. This was originally considered but not included in this analysis due to the fact that on many sites the area serving as the above ground detention also fulfills other zoning requirements such as open space. In other words, even if these sites paid a fee in lieu of detention, they would still have to preserve much of the same area for use as open space. However, this was not the case on these 4 projects. In these cases, the underground detention allowed for more developable space on the site. In a way, inclusion of projects with underground detention indirectly accounts for land value. In addition, underground detention systems are becoming more prevalent in Springfield and it seems appropriate to include them in the analysis to represent a more complete spectrum of projects. Five of the 12 projects showed that the cost to design and construct the detention basin was less than the current “fee in lieu of”. This seems to buck the trend that costs generally increase over time and the reason for this is undetermined. Every site is different and there are many factors that could impact the cost such as topography and the need for retaining walls, rock excavation, site constraints, market conditions, economies of scale, aesthetics and improvements not included in every basin e.g., concrete trickle channel. It’s important to keep in mind that the “fee in lieu of” is optional i.e., developers can always choose to construct stormwater detention on site if they would prefer not to pay the fee. Something else to note is the excessive cost of the detention basin at Site 12 which is the largest site and appears to not benefit from economies of scale. In reviewing the data, it’s apparent that due to the steep terrain the amount of excavation for constructing the detention basin is nearly double the required volume, greatly increasing the cost. Additional data is needed in the future to better establish the trendline at these larger volumes. Figure 2 is a graph showing the relationship between detention volumes to cost. This was prepared since the rate structure is based on volume. The “fee in lieu of” is also plotted on this graph and it’s evident that the current rate structure doesn’t accurately reflect the actual cost for the larger basins. However, this is due largely in part to the one data point that is somewhat of an outlier and is skewing the trendline upward. At the same time this site shouldn’t be completely disregarded since it represents an actual site with real costs no different than the other data points. Increases to the fee structure for the “Other Land Uses” category have been made to more closely mimic the actual costs for design and constructing a detention basin. This is illustrated in Figure 3 and the proposed fee structure is shown below in Table 2. For the three volume categories, the rate increased by 25, 50, and 100 percent with the largest increase in the “> 100,000” category to adjust for the divergence in the current “fee in lieu of” rate as the volumes increase. For comparison purposes, the consumer price index (CPI) for “all urban consumers in U.S. City average”, as published by the U.S. Bureau of Labor Statistics, was referenced. This showed an increase of 54 percent between October 2001 and August 2021 and falls within the limits of proposed increases of 25 to 100 percent.

Volume of Detention (cf)	1 or 2 Family Residential	Other Land Uses
0 – 24,000	$1 per cf	$2.50 per cf
24,001 – 100,000	$0.50 per cf	$1.50 per cf
> 100,000	$0.50 per cf	$1.00 per cf

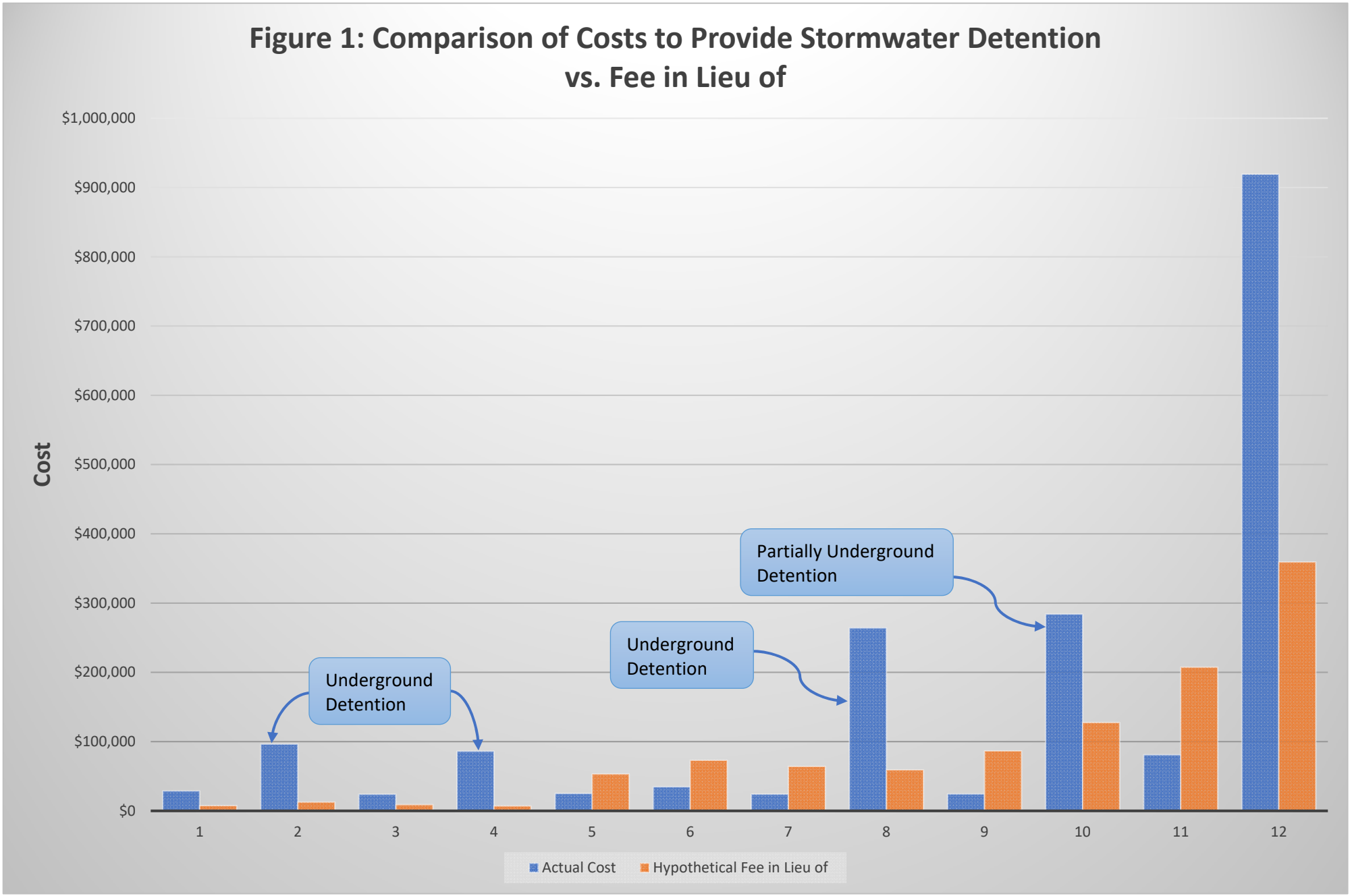
Table 2: Proposed Fee Structure

For comparison purposes, Table 3 below shows what the rates would be if adjusted based solely on the CPI.

Volume of Detention (cf)	1 or 2 Family Residential	Other Land Uses
0 – 24,000	$1.54 per cf	$3.08 per cf
24,001 – 100,000	$0.77 per cf	$1.54 per cf
> 100,000	$0.77 per cf	$0.77 per cf

Table 3: Fee Structure if Based on CPI

Figure 1: Comparison of Costs to Provide Stormwater Detention vs. Fee in Lieu of



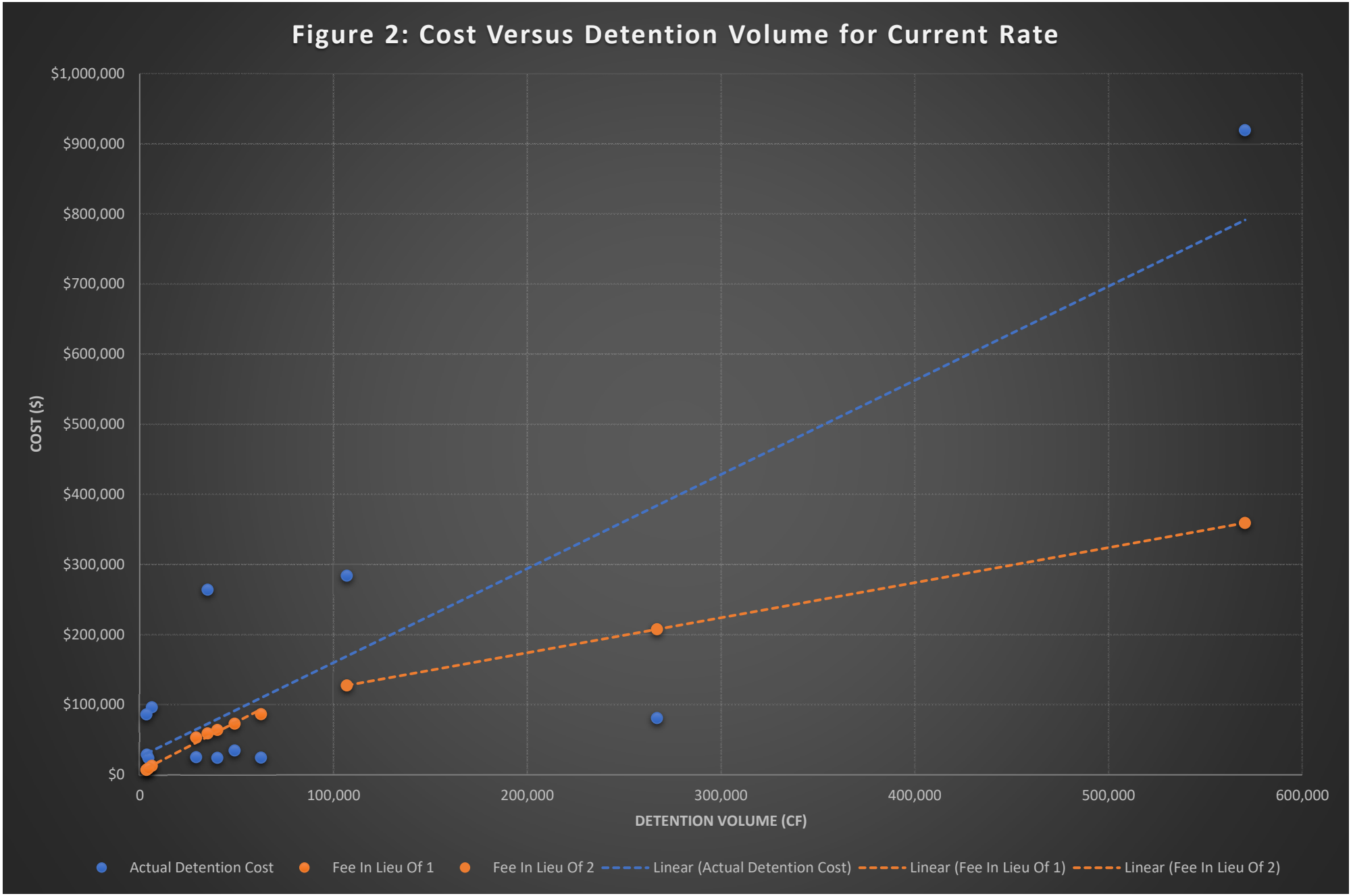


Figure 2: Cost Versus Detention Volume for Current Rate
$1,000,000
$900,000
$800,000
$700,000
$600,000
$500,000
$400,000
$300,000
$200,000
$100,000
$0
COST ($)
0
100,000
200,000
300,000
400,000
500,000
600,000
DETENTION VOLUME (CF)
Actual Detention Cost
Fee In Lieu Of 1
Fee In Lieu Of 2
Linear (Actual Detention Cost)
Linear (Fee In Lieu Of 1)
Linear (Fee In Lieu Of 2)

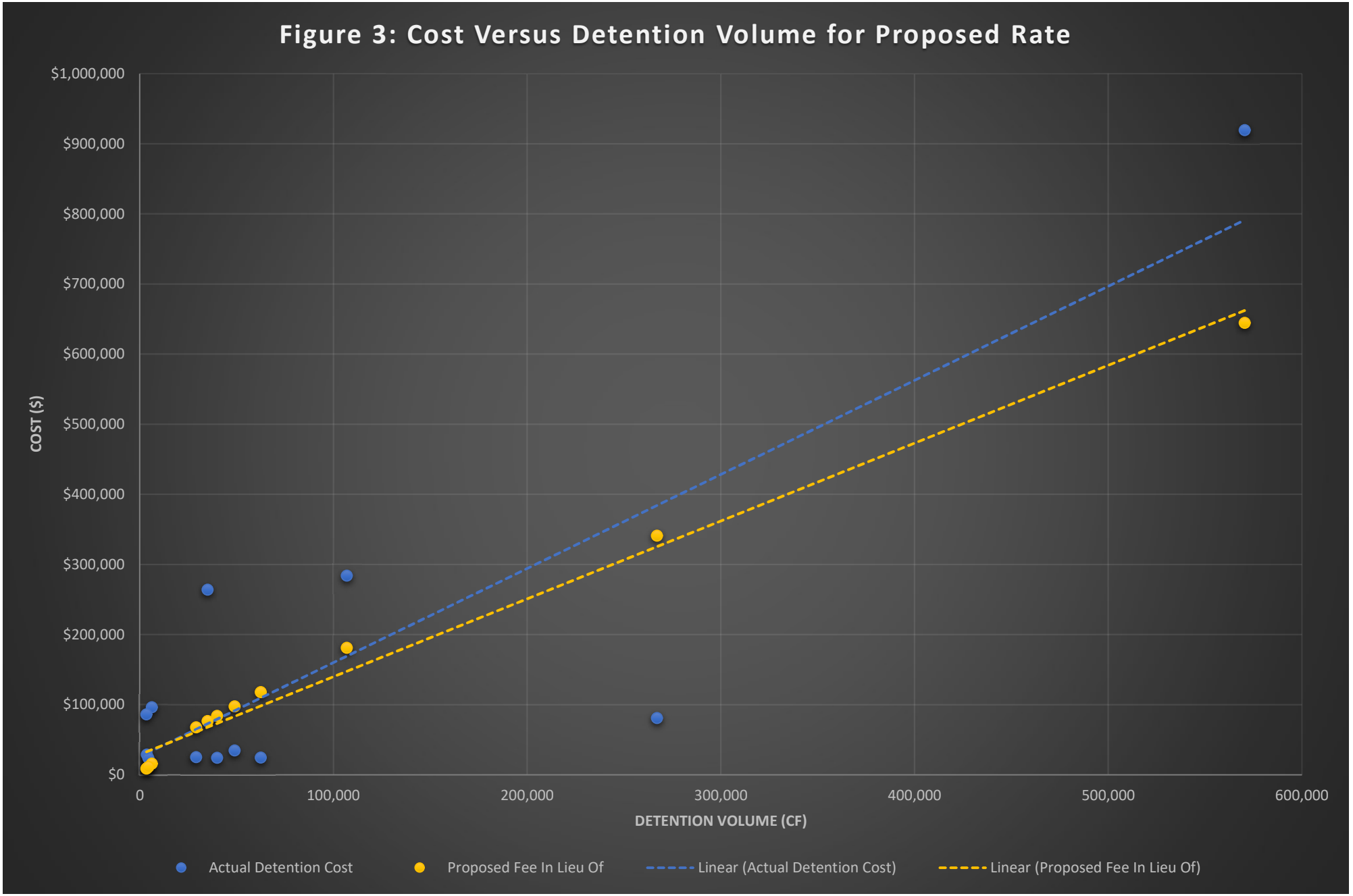


Figure 3: Cost Versus Detention Volume for Proposed Rate
$1,000,000
$900,000
$800,000
$700,000
$600,000
$500,000
$400,000
$300,000
$200,000
$100,000
$0
COST ($)
0
100,000
200,000
300,000
400,000
500,000
600,000
DETENTION VOLUME (CF)
Actual Detention Cost
Proposed Fee In Lieu Of
Linear (Actual Detention Cost)
Linear (Proposed Fee In Lieu Of)

Appendix

Address	E Cardinal	E Walnut	Walnut Lawn	S. Meadowview	E Sunshine	W Kearney	E Battlefield	W University	E Sunshine	N Eastgate	N Eastgate	Western Meadows
Type of development	Residential	Residential	Residential	Commercial	Commercial	Commercial	Commercial	Commercial	Commercial	Commercial	Commercial	Residential
Area of site (ac.)	1	1.69	4.48	0.6	1.61	5.2	6.2	9.23	10.5	34.5	49	5.1
Type of development	Apartments	Apartments	Apts & Townhomes	Office	Restaurant	future com	Cox Clinic	Mixed Use	Hy-Vee	Menards	Costco	Single Family Homes
Buyout Cost	$12,642.00	$7,020.00	$53,196.00	$7,490.00	$8,974.00	$64,032	$59,109	$86,564	$127,470	$207,512	$359,241	$72,973
Type of Detention	pervious pavement	underground	above ground	above ground	above ground	above ground	underground	above ground	combination	above ground	above ground	above ground
Design Cost	$ 2,000.00	$ 6,000.00	$ 2,500.00	$ 1,900.00	$ 4,000.00	$ 14,000.00	$ 4,000.00	$ 4,250.00	$ 4,000.00	$ 4,500	$ 7,000.00	$ 4,000.00
Construction Cost	$ 94,300.00	$ 80,000.00	$ 22,500.00	$ 26,782.00	$ 19,860.00	$ 10,100.00	$ 260,000.00	$ 20,146.00	$ 280,000.00	$ 76,348	$ 912,254.00	$ 30,630
Total Cost	$ 96,300.00	$ 86,000.00	$ 25,000.00	$ 28,682.00	$ 23,860.00	$ 24,100.00	$ 264,000.00	$ 24,396.00	$ 284,000.00	$ 80,848	$ 919,254.00	$ 34,630

Note: Several of the projects listed would not qualify for a fee in lieu of detention due to downstream flooding concerns (e.g. Menards, Costco, Zaxby's, Hy-Vee, and CoxHealth). The table provides actual engineering and construction costs for comparison to adjusting the fee in lieu based solely on the CPI.

CPI for All Urban Consumers (CPI-U)
Original Data Value

Series Id: CUUR0000SA0
Not Seasonally Adjusted
Series Title: All items in U.S. city average, all urban consumers,
Area: U.S. city average
Item: All items
Base Period: 1982-84=100
Years: 2001 to 2021

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2001	175.1	175.8	176.2	176.9	177.7	178.0	177.5	177.5	178.3	177.7	177.4	176.7
2002	177.1	177.8	178.8	179.8	179.8	179.9	180.1	180.7	181.0	181.3	181.3	180.9
2003	181.7	183.1	184.2	183.8	183.5	183.7	183.9	184.6	185.2	185.0	184.5	184.3
2004	185.2	186.2	187.4	188.0	189.1	189.7	189.4	189.5	189.9	190.9	191.0	190.3
2005	190.7	191.8	193.3	194.6	194.4	194.5	195.4	196.4	198.8	199.2	197.6	196.8
2006	198.3	198.7	199.8	201.5	202.5	202.9	203.5	203.9	202.9	201.8	201.5	201.8
2007	202.4	203.5	205.4	206.7	207.9	208.4	208.3	207.9	208.5	208.9	210.2	210.0
2008	211.1	211.7	213.5	214.8	216.6	218.8	220.0	219.1	218.8	216.6	212.4	210.2
2009	211.1	212.2	212.7	213.2	213.9	215.7	215.4	215.8	216.0	216.2	216.3	215.9
2010	216.7	216.7	217.6	218.0	218.2	218.0	218.0	218.3	218.4	218.7	218.8	219.2
2011	220.2	221.3	223.5	224.9	226.0	225.7	225.9	226.5	226.9	226.4	226.2	225.7
2012	226.7	227.7	229.4	230.1	229.8	229.5	229.1	230.4	231.4	231.3	230.2	229.6
2013	230.3	232.2	232.8	232.5	232.9	233.5	233.6	233.9	234.1	233.5	233.1	233.0
2014	233.9	234.8	236.3	237.1	237.9	238.3	238.3	237.9	238.0	237.4	236.2	234.8
2015	233.7	234.7	236.1	236.6	237.8	238.6	238.7	238.3	237.9	237.8	237.3	236.5
2016	236.9	237.1	238.1	239.3	240.2	241.0	240.6	240.8	241.4	241.7	241.4	241.4
2017	242.8	243.6	243.8	244.5	244.7	245.0	244.8	245.5	246.8	246.7	246.7	246.5
2018	247.9	249.0	249.6	250.5	251.6	252.0	252.0	252.1	252.4	252.9	252.0	251.2
2019	251.7	252.8	254.2	255.5	256.1	256.1	256.6	256.6	256.8	257.3	257.2	257.0
2020	258.0	258.7	258.1	256.4	256.4	257.8	259.1	259.9	260.3	260.4	260.2	260.5
2021	261.6	263.0	264.9	267.1	269.2	271.7	273.0	273.6				

Percent Increase **54%**