



City of Arts & Innovation

Board of Library Trustees

TO: BOARD OF LIBRARY TRUSTEES **DATE: JUNE 25, 2018**

FROM: RIVERSIDE PUBLIC LIBRARY

SUBJECT: DETERMINE 3D PRINTING FEES AND CHARGES

ISSUES:

Determine the 3D printing fees to the library fees and charges and refer to the Finance Committee for addition to Chapter 3.30 of the Riverside Municipal Code Fee and Service Charge Revenue/Cost Comparison System.

RECOMMENDATIONS:

That the Board of Library Trustees:

1. Discuss and determine the 3D printing fees to the Library fees and charges; and
2. Refer to the Finance Committee and City Council for consideration. Upon City Council approval, fees will become effective in 60 days.

BACKGROUND:

On October 26, 2015, the Board of Library Trustees unanimously approved acceptance of a donation in the amount of \$6,500 from five Riverside Rotary Clubs. This donation was directed toward the purchase of a 3D printer, which would be located in the new Library Makerspace. Library Board member Evans, and club member of Riverside East Rotary, led the effort in securing donations from the five clubs. The library purchased its first 3D printer from Makerbot, a prominent vendor in the 3D printer marketplace.

On January 25, 2016, the Board of Library Trustees approved the Library 3D Printer Policy. Included in the policy were nominal fees that customers would be charged for the production and materials to print 3D objects. The fees were approved by the Board in order to recover some of the expenses incurred by the Library to operate the printer and provide printing to the public.

The fees approved for 3D printer policy (attached) included:

1. \$1.00 fee for setting a print job.

2. \$0.10 fee for each 1 gram of plastic used (rounded up to the whole next whole gram), including a raft and any supports if required or requested.
3. At staff's discretion, the setup fee may be waived when additional copies of the same item are requested within a 30 day period of the original print.

At this time all grant funds and donations raised for the creation of the Makerspace equipment and fixtures have been spent. The fee schedule originally approved by the Board of Library Trustees has not been implemented.

On September 25, 2017, the Board of Library Trustees considered amending the library fees and charges related to 3D printing. At this meeting they requested further information relative to total 3D printing costs.

DISCUSSION:

On September 25, 2017, the Board requested that Staff review and provide further research on fees other Libraries charge for 3D printing and the Riverside Public Library's costs for maintaining the 3D printer. A main concern from Board members was the \$1.00 setup fee for a small objects and the \$0.10 fee for each 1 gram of plastic/filament used for printing. Trustees suggested that the cost of filament charged to the public be reduced between \$0.02 to \$0.10 per gram and to take into consideration waiving the cost of the \$1.00 setup fee.

Staff have contacted neighboring library systems and have found that the majority of locations provide 3D printing to the public within a Science, Technology, Reading, Engineering, Art and Math (STREAM) related program. The table below provides information on what 3D printing fees are in other Library systems.



Other Library Systems Fees:


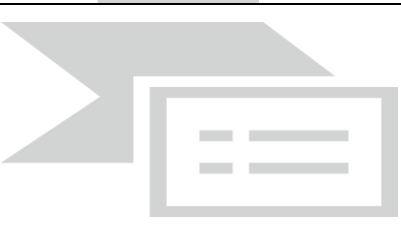
Other Library Systems			
Location	Policy	Printing Fees	Other Information
Marin County Free Library	Yes	Free	Costs covered by Marin County Free Library Foundation and Friends of the Marin County Free Library
Montclair Public Library	Yes	\$0.10 per 1 gram of filament used in 3D print. \$0.30 up charge for Glow in the Dark	
Moreno Valley Public Library	No	Do not offer 3D printing	
Ontario Public Library	No	Do not offer 3D printing	
Palm Springs Public Library	n/a	Free	Only for library programs
Rancho Cucamonga Public Library	n/a	Free	Only for library programs
Rancho Mirage Public	n/a	Free	Only for library programs

Library			
Riverside Community College	No	Do not offer 3D printing	
Sacramento Public Library	Yes	Free, Grant funded	Grant funded
San Diego City Library	Yes	Free	Paid for by the Friends of the San Diego Public Library; 2 hour time limit
Sunnyvale Public Library, CA	No	Free	Grant funds \$13,500
Thousand Oaks Public Library	Yes	There is a \$1.00 fee for all 3D printing jobs plus \$0.05 per gram based on the weight of the item and the use of filament.	
University of California, Riverside	n/a	Only for UCR students	
Upland Public Library	No	Do not offer 3D printing	
Yorba Linda Public Library	Yes	\$1.00 setting fee and \$0.10 per gram	

Alternative Fee Structure:

Other libraries such as the Port Washington Public Library charged \$1.00 per hour or \$0.25 per 15 minutes rather than a set-up fee charge. A \$0.10 fee per gram of filament used for the printed object was also charged. A sample of 3D printed items from the Port Washington Public Library found at <http://www.pwpl.org/3d-printing/3d-printing-guidelines/> are listed below as an alternative in charging a fee on an estimated time scale rather than a standard set-up fee.

3D Printed Item Port Washington Public Library	Size	Hours	Fee \$.25 per 15 minutes	Filament	Fee \$.10 per gram
 Key Chain	X: 4 ⁹ / ₁₆ inch Y: 5 ³ / ₆₄ inch Z: ⁵ / ₃₂ inch	1 Hour	\$1	13 grams	\$1.30
 Maker Robot	X: 2 ²⁹ / ₆₄ inch Y: 2 ³ / ₁₆ inch Z: 1 ¹⁹ / ₃₂ inch	2.5 Hours	\$2.50	57grams	\$5.70

	Eiffel Tower	X: 2 ³ / ₁₆ inch Y: 2 ³ / ₁₆ inch Z: 4 ⁴⁹ / ₆₄ inch	2.25 Hours	\$2.25	32 grams	\$3.20
	Car	X: 3 ⁵⁷ / ₆₄ inch Y: 1 ⁴⁷ / ₆₄ inch Z: 1 ³ / ₁₆ inch	2.25 hours	\$2.25	82 grams	\$8.20

Print Hours at Riverside Public Library:

Since the purchase of the Makerbot 3D printer, the Riverside Public Library has purchased an additional eight Dremel 3D printers. This ensures there is 3D print capability at every library location. 3D printing is a significant activity for all library locations. Listed below is an analysis of total number of 3D prints during the timeframe of January 2018 through May 2018.

Total Number of 3D Prints		
Library Location	Total Prints January 2018 – May 2018	Estimated Total Hours
Orange Terrace Library	309	2008
Main Library	267	1735
Arlington Library	207	1345
Marcy Library	195	1267
La Sierra Library	189	1228
SPC. Jesus S. Duran Eastside Library	189	1228
Arlanza Library	155	1007
SSgt. Salvador J. Lara Casa Blanca Library	89	578
Total	1,600	10,400

Using the proposed \$1.00 set up fee and per gram fee structure revenue would have been \$4,720. Without the \$1.00 set up fee, the revenue for the total prints would have been approximately \$3,120. A per hour charge would have generated approximately \$10,400 in revenue.

Filament Costs:

Cost of replacement filament is the primary expense item for 3D prints for the Riverside Public Library. During the timeframe of August 2017 through May 2018, the Library has purchased filament and other required operating supplies amounting to \$3,055. The filament purchased are Itemized the following table.

Filament Purchased					
Vendor	Item Purchased	Date Purchased	Quantity Ordered	Price per Item	Total
Uline	Masking Tape	08/10/17	24	\$28	\$672
Coex	Filament	08/17/17	48	\$16	\$768
Coex	Filament	01/09/18	69	\$17.59	\$1,214
Uline	5 Gallon Buckets	03/19/18	10	\$5.05	\$51
Uline	5 Gallon Bucket Lid	03/19/18	10	\$8.00	\$80
Uline	Silica Gel Packets	03/19/18	1	\$97.00	\$97
Dremel	3D40 Nozzle Assembly	04/18/18	2	\$86.25	\$172
Total					\$3,055

Warranties and Maintenance Costs:

The warranties for the Dremel and Makerbot printers have expired. Over the past year, there were 2 to 3 service calls per library location. The cost per service call is projected at approximately \$150 per call.

The maintenance repairs thus far include replacing two nozzle assembly parts that have reached their useful life span. The nozzle assembly guides the filament into the actual extruder which allows for precision in creating objects. Staff projects repairs for the 3D printers to amount to approximately \$1,706 and ongoing maintenance costs to be approximately \$3,000 annually.

Maintenance Repairs to Date				
3D Printer	3D Pinter Part	Quantity	Price Per Item	Total Price
Dremel	3D40 Nozzle Assembly	2	\$86.25	\$173
Total				\$173

Projected Annual Maintenance Repairs				
3D Printer	3D Pinter Part	Quantity	Price Per Item	Total Price
(8) Dremmel DC40	Nozzle Assembly	8	\$87	\$696
	Fan Replacement	8	\$22	\$176
	Extruder Motor Assembly	8	\$55	\$440
(1) Makerbot	Smart Extruder	1	\$199	\$199
(1) LutzBot	Extruder Tool Head	1	\$195	\$195

Total	\$1,706
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Projected Annual Maintenance costs			
Number of 3D Printers	Average cost per service call	Average service calls per year	Projected service costs per year
10	\$150	2	\$3,000
Total			\$3,000

FISCAL IMPACT:

The fiscal impact of this report will depend on the 3D printing fee revenue rate determined by the Board of Library Trustees, the Finance Committee and the City Council. Currently, the costs to operate the 3D printer to the public is approximately \$4,000 to \$6,000 annually. These expenses are paid from the Library Gift Fund account 5145000-450201.

Prepared by: Erin Christmas, Acting Library Director
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Attachment: 3D Printer Policy