

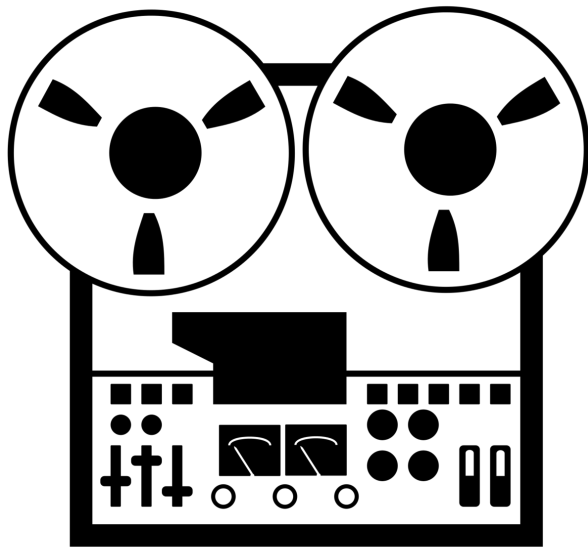


# COST OF INACTION CALCULATOR

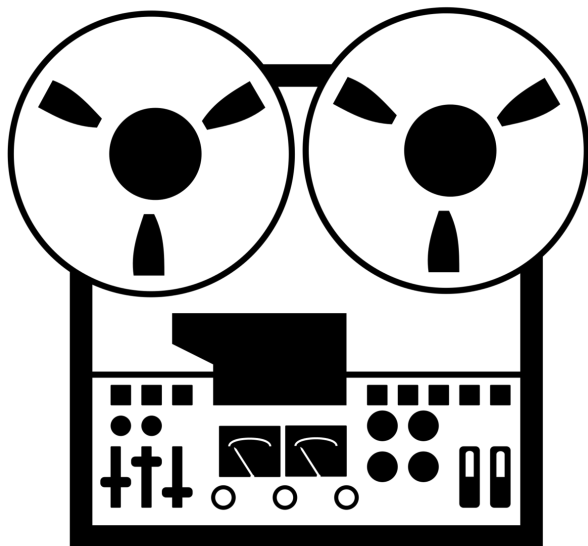
Chris Lacinak  
**AVPreserve**  
chris@avpreserve.com  
@avpreserve

The End

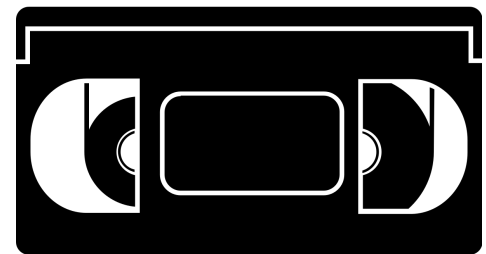
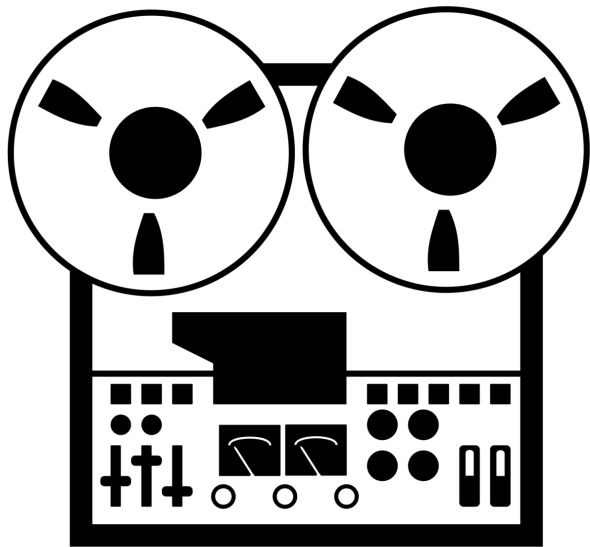
The End



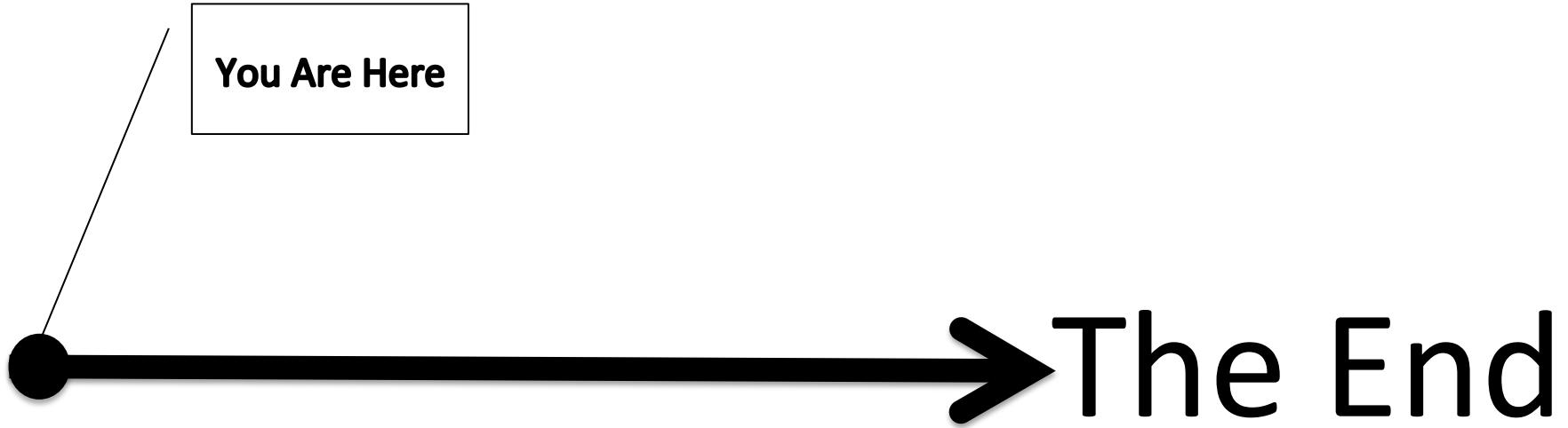
# The End



# The End



The End



You Are Here

The End

**You Are Here**

● **The End**



“in the **mid- to long-term** there is a major risk that carrier degradation combined with playback obsolescence will defeat the efforts of archivists...”

--International Association of Sound and Audiovisual Archives (IASA), Task Force to Establish Selection Criteria Report, 2003

“...it is alarming to realize that nearly all recorded sound is in peril of disappearing or becoming **inaccessible within a few generations.**”

--National Recording Preservation Board, Capturing Analog Sound for Digital Preservation, 2006

“...many analog audio **recordings must be digitized within the next 15 to 20 years** – before sound carrier degradation and the challenges of acquiring and maintaining playback equipment make the success of these efforts too expensive or unattainable.”

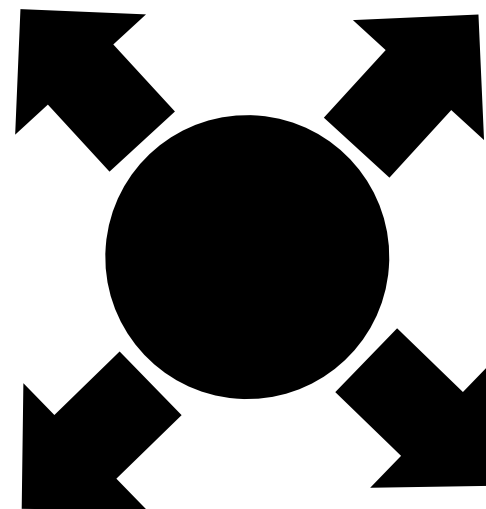
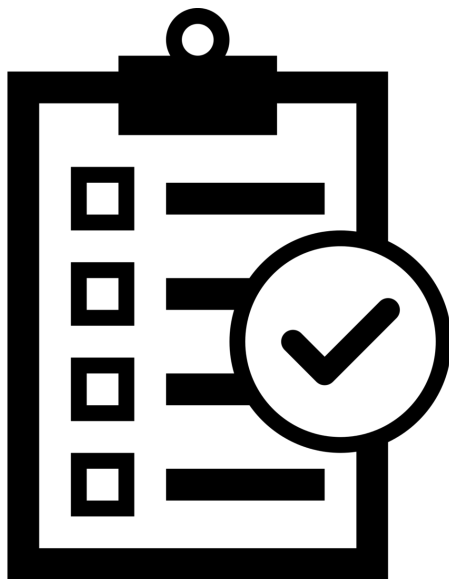
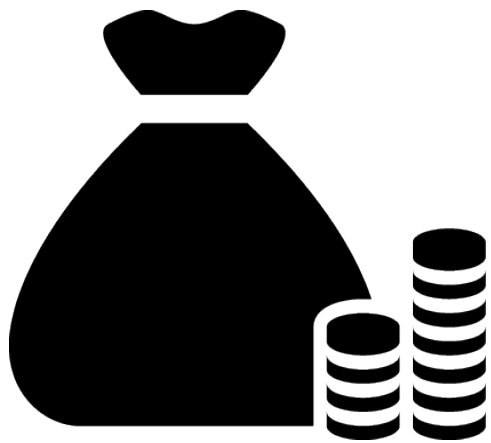
--The Library of Congress, National Recording Preservation Plan, 2012

**“So that’s it: going, going, gone for analog by  
2023”**

--Richard Wright, PrestoCentre.org Blog, 2013

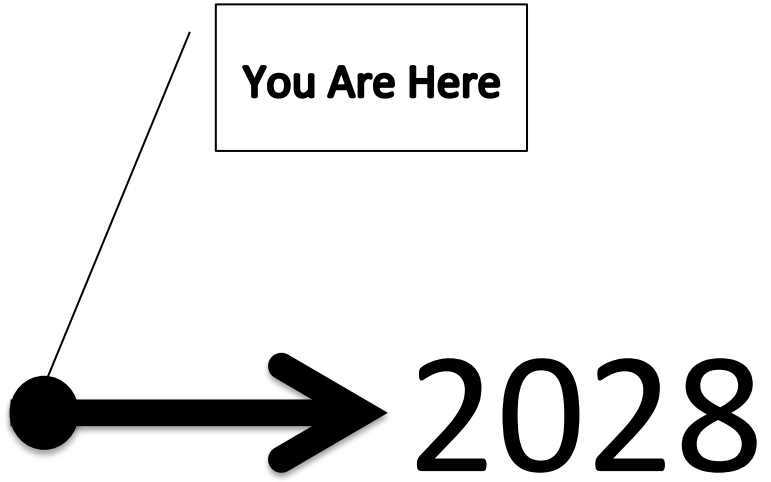
**“How much time do we have? 10 – 15 Years”**

--Michael Casey, Indiana University, Association for  
Recorded Sound Collections (ARSC) Conference, 2013



**You Are Here**

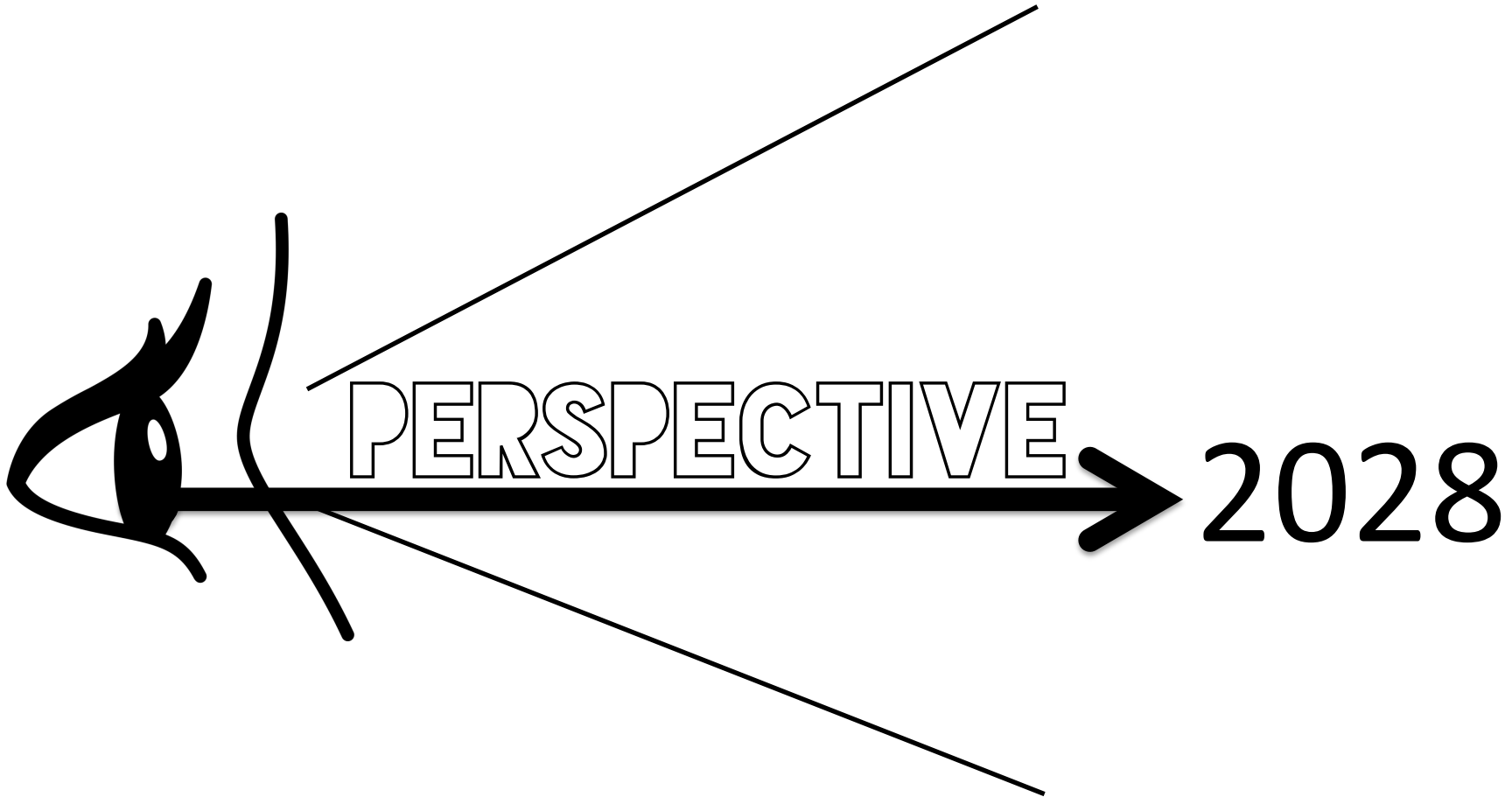






**You Are Here**

● **The End**



# Sustainable Economics for a Digital Planet:

Ensuring Long-Term Access to Digital Information

February 2010

Final Report of the  
Blue Ribbon Task Force on  
Sustainable Digital Preservation and Access

“Another **misleading perception** about digital preservation investments is that ...choices are binary: **either we implement intensive preservation ...immediately and forever; or we do nothing....** A relatively small investment may be enough to preserve the option of making larger commitments in the future ”

--Blue Ribbon Task Force: Sustainable Economics for a Digital Planet (2010)  
Page 99

“When future conditions are particularly uncertain ... it is often economically justified to make a small current investment that in effect **purchases the option to make a choice sometime in the future.**”

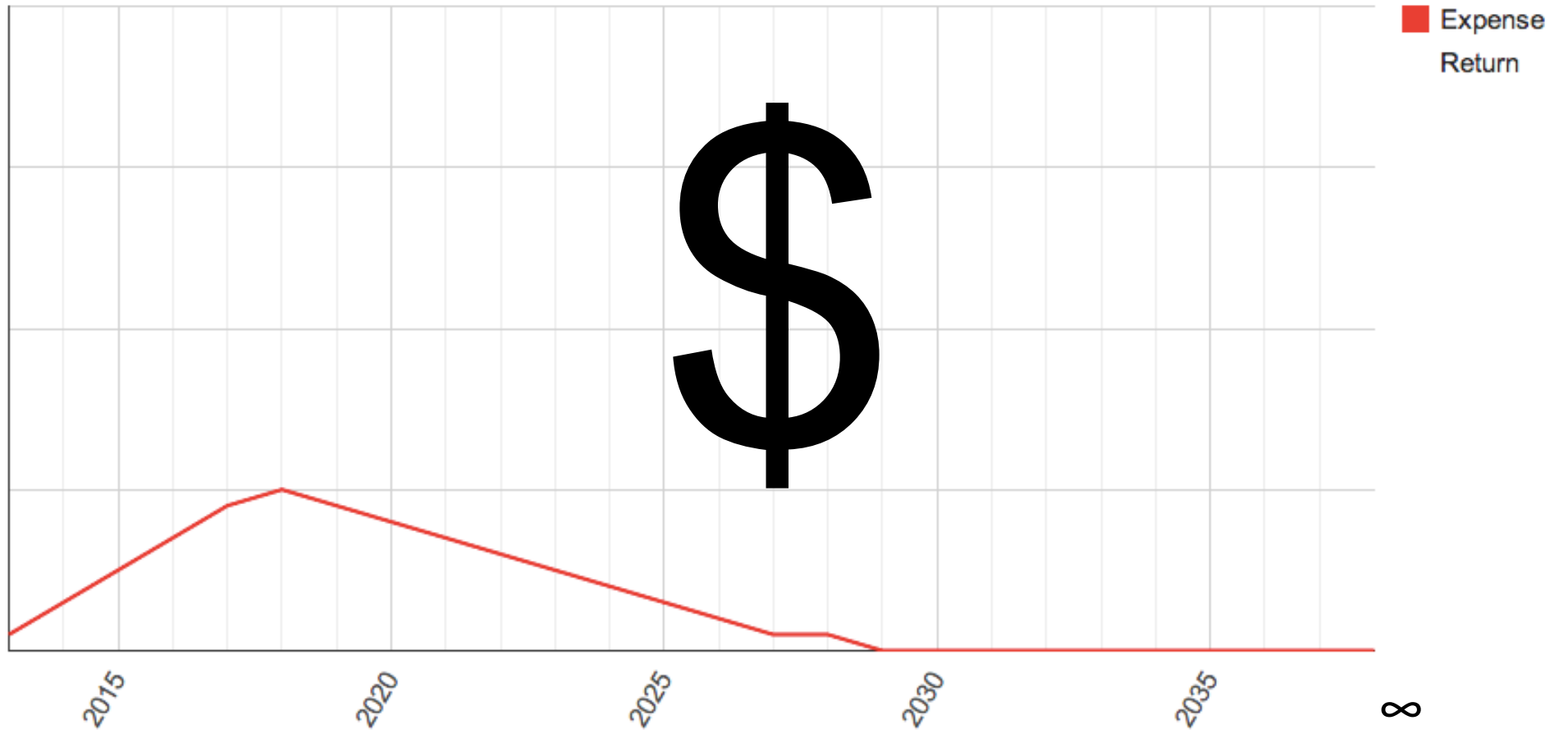
--Blue Ribbon Task Force: Sustainable Economics for a Digital Planet (2010)  
Page 37

“Commitments made today are not commitments for all time. But **actions must be taken today to ensure flexibility in the future**”

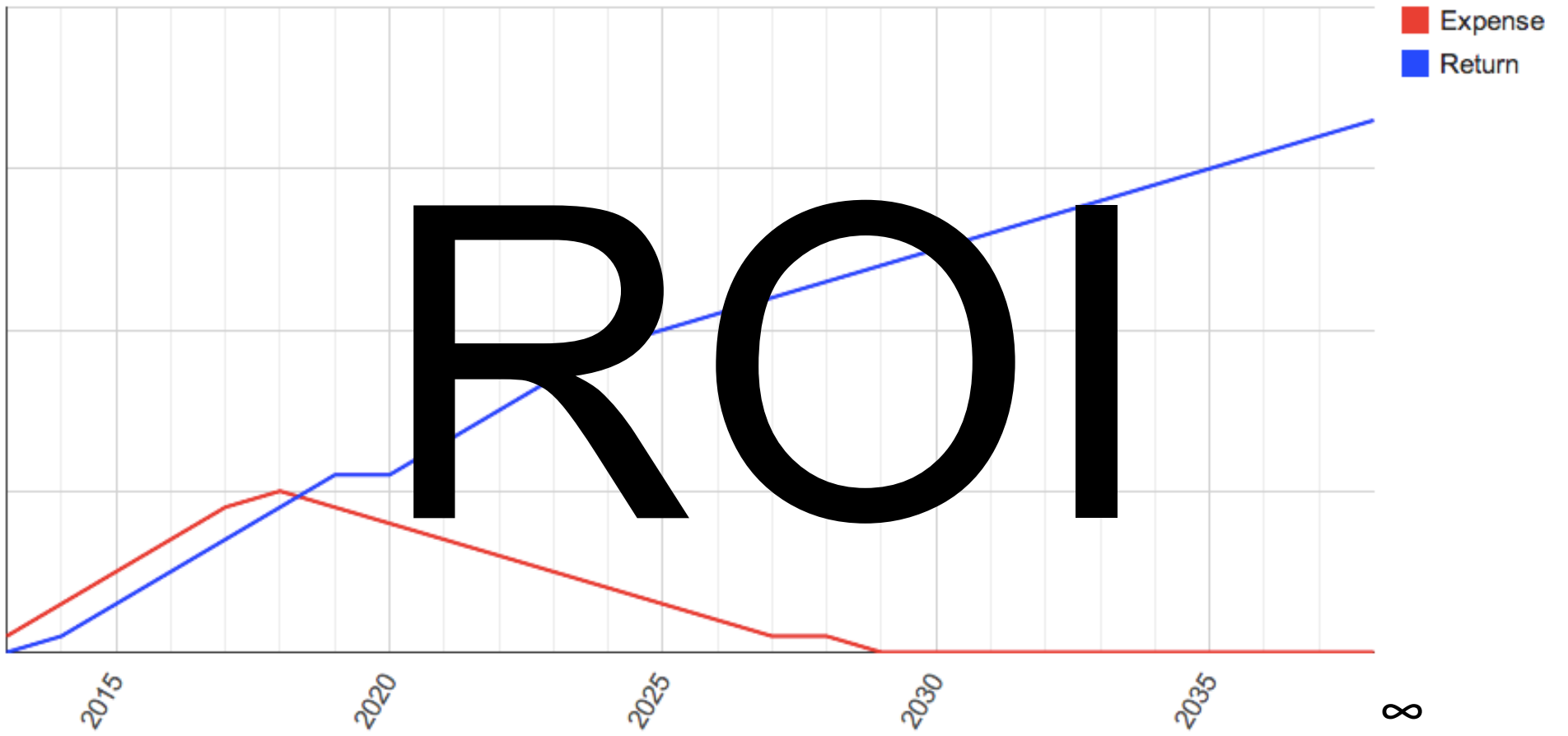
--Blue Ribbon Task Force: Sustainable Economics for a Digital Planet (2010)

Page 5

\$









## Income

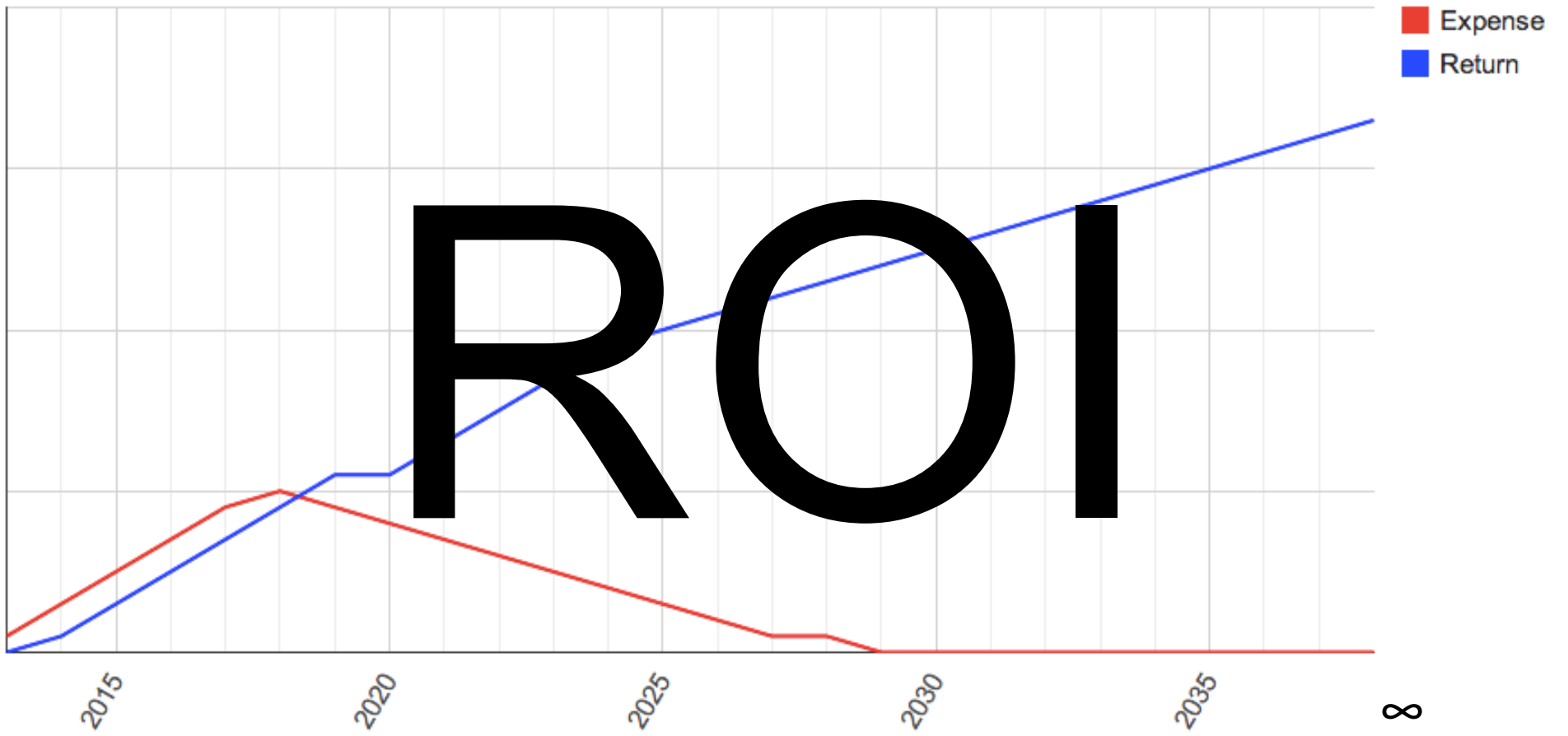
Donations & Endowments	\$	1,000,000
Services	\$	1,000,000
<b>Total Income</b>	<b>\$</b>	<b>2,000,000</b>

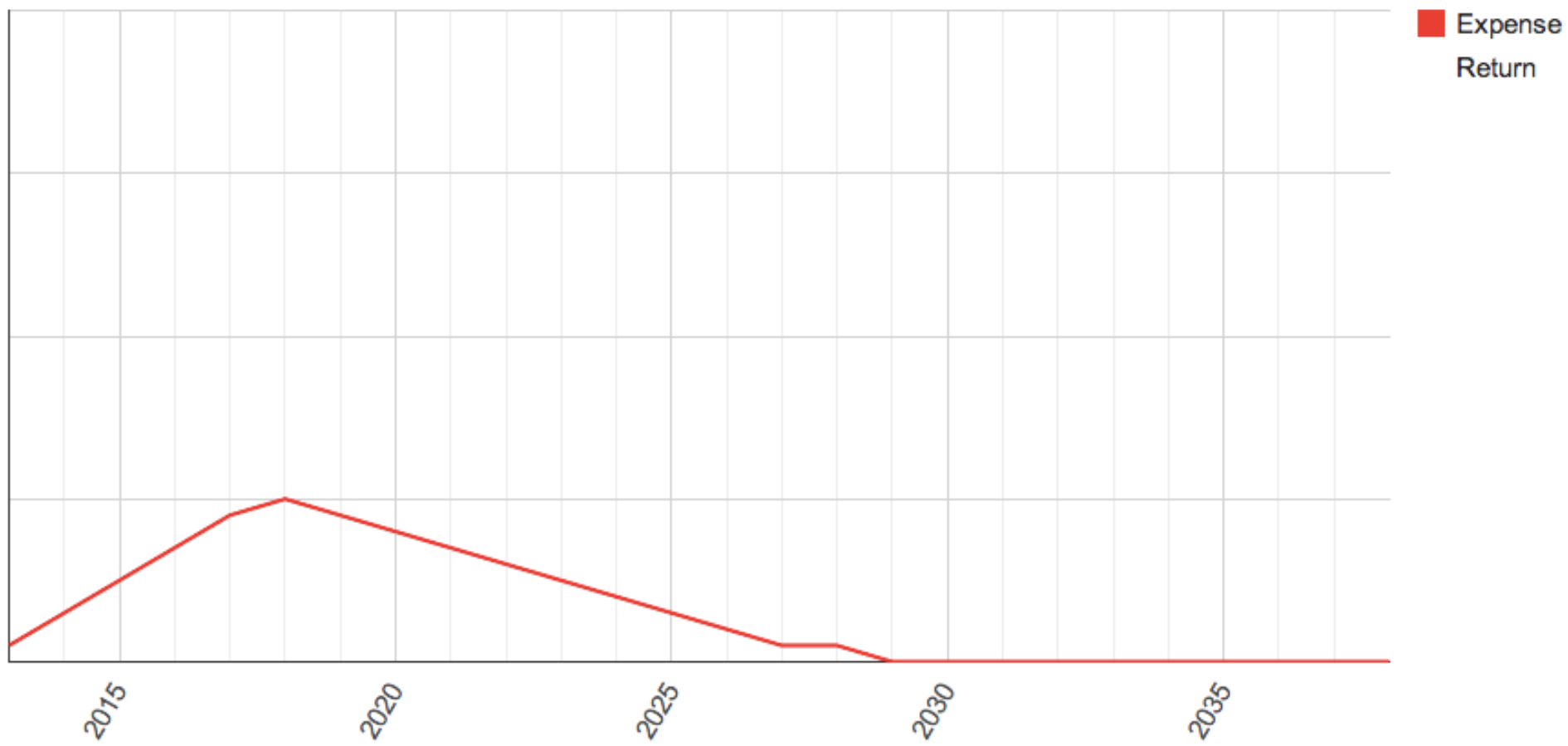
## Expenses

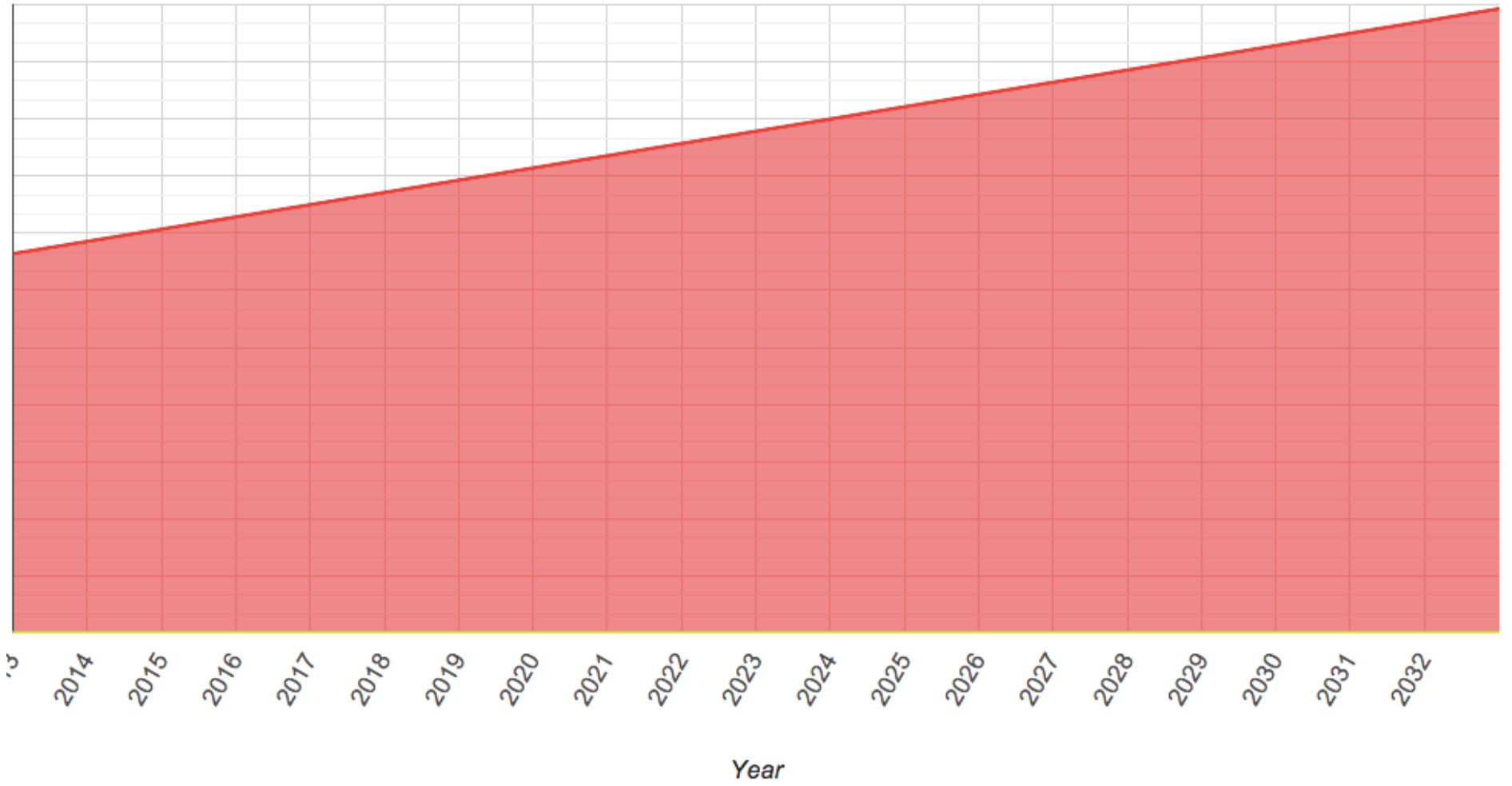
Conferences & Meetings	\$	125,000
Cultural Heritage		Lost
Equipment	\$	200,000
Insurance	\$	50,000
Professional Services	\$	125,000
Real Estate	\$	400,000
Salaries	\$	700,000
Utilities	\$	150,000

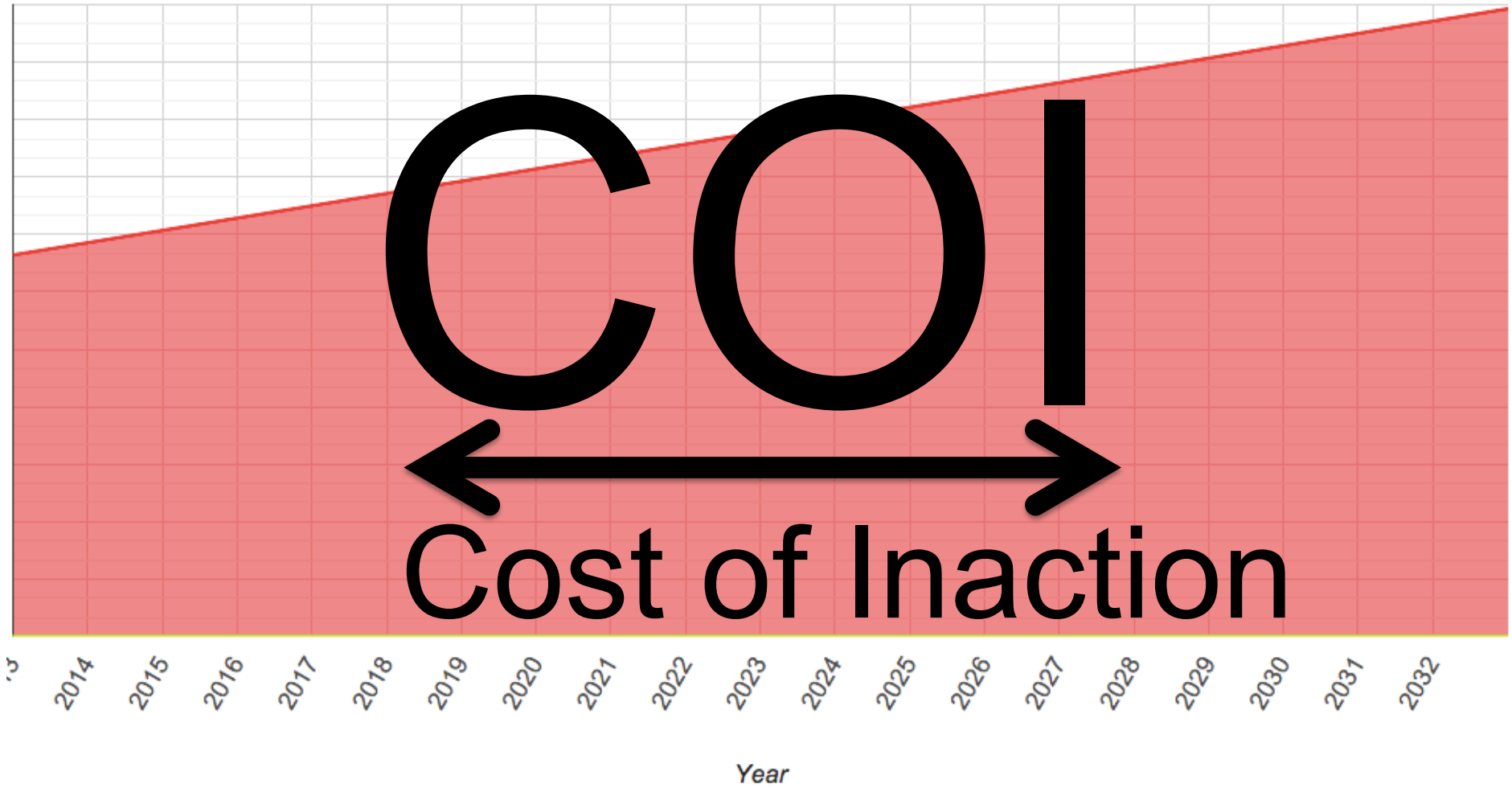
**Total Expense** #VALUE!

**Net Income** #VALUE!









# COST OF INACTION CALCULATOR



You've invested time and money to preserve the physical objects in your media collection.



However, over time audiovisual materials will become unusable due to decay and obsolescence.



The only way to save your collection is to reformat through digitization.



The cost of digitization may be great, but the cost of inaction may be even greater.

[ANALYZE YOUR COLLECTION »](#)

Use our calculator to analyze your Cost of Inaction



**Provides concrete data points to help**



**Offers financial and non-financial**



**Generates a timeline for planning and**



**Enables comparative analysis of**



Save

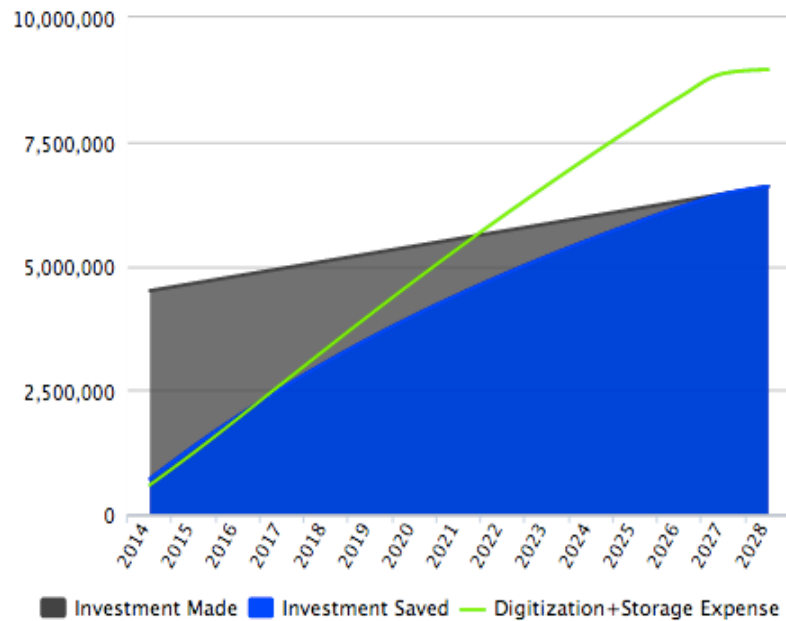
Get Link



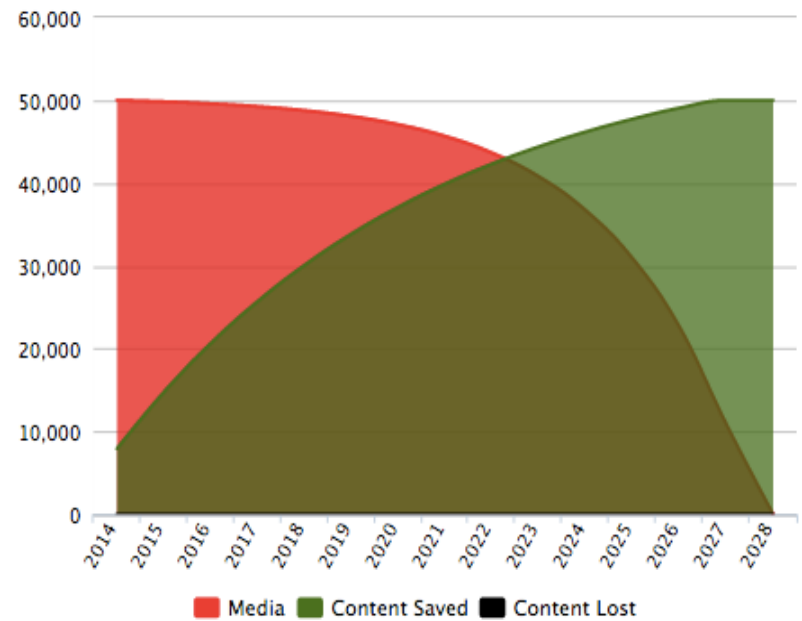
## Enter your collection details

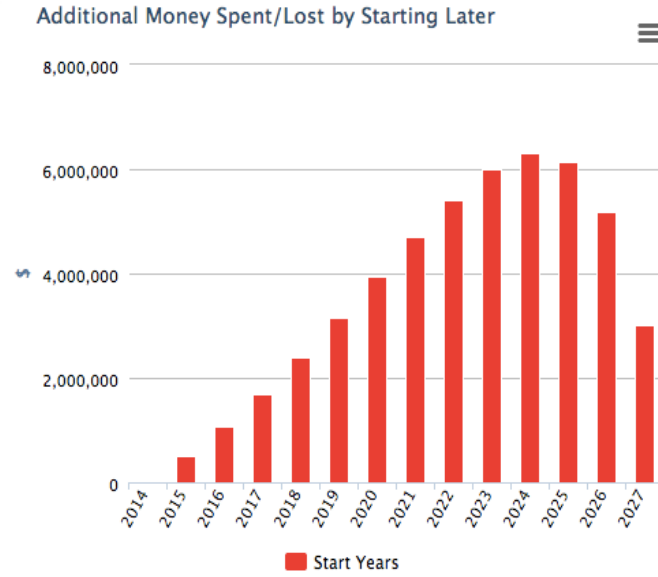
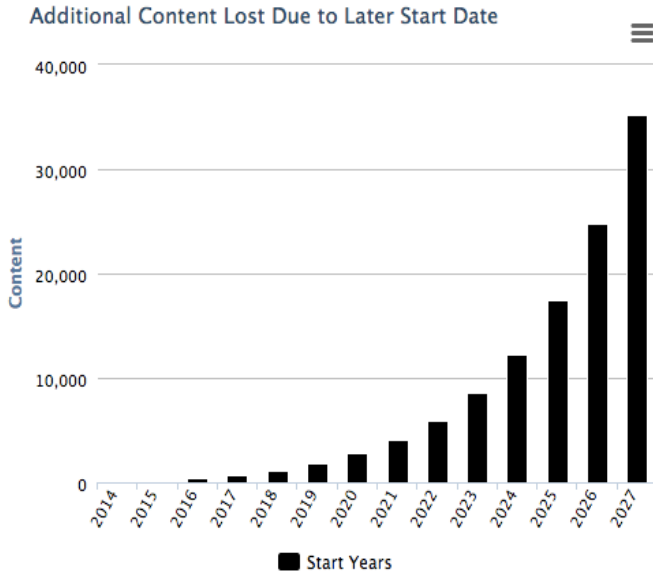
Last year for magnetic media? <b>2028</b>	Number of objects in collection? <b>50,000</b>	Collection's audio-video percentage? 50% Video 50% Audio	Investment to date for media? <b>\$4,500,000</b>	Annual cost per media item moving forward? <b>\$3</b>	Digitization cost per <b>\$60</b>
Year you will start digitizing items? <b>2014</b>	Annual digitization <b>\$475,000</b>	Storage service? <b>Amazon</b>	Annual decrease in cost of storage? <b>15%</b>	Annual increase in cost of digitization? <b>16%</b>	

### Investment Analysis



### Item and Accessibility Analysis





[Export to CSV](#)

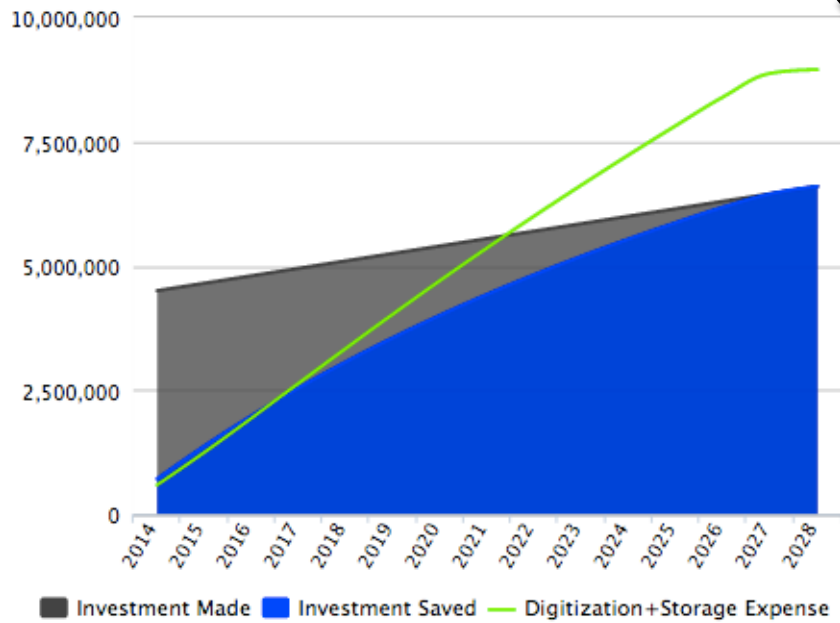
Year Digitization Started	Annual Digitization Budget Required	Storage Cost by 2028	Total Spent by 2028	Investment Lost	Add'l Spent due to later start	Spent + Lost by 2028	Content Lost	\$ Spent + Lost Cumulative Difference	Content Lost Cumulative Difference	% More \$ Spent + Lost	% More Content Lost
2014	\$473,012	\$1,136,391	\$7,758,559	\$0	\$0	\$7,758,559	0	\$0	0	100.00%	0.00%
2015	\$559,699	\$953,798	\$8,229,885	\$21,787	\$471,326	\$8,251,672	165	\$493,113	165	106.36%	0.33%
2016	\$664,271	\$797,830	\$8,769,082	\$52,563	\$1,010,523	\$8,821,645	398	\$1,063,086	398	113.70%	0.80%
2017	\$791,080	\$664,418	\$9,366,298	\$96,038	\$1,607,739	\$9,462,336	728	\$1,703,777	728	121.96%	1.46%

### Enter your collection details

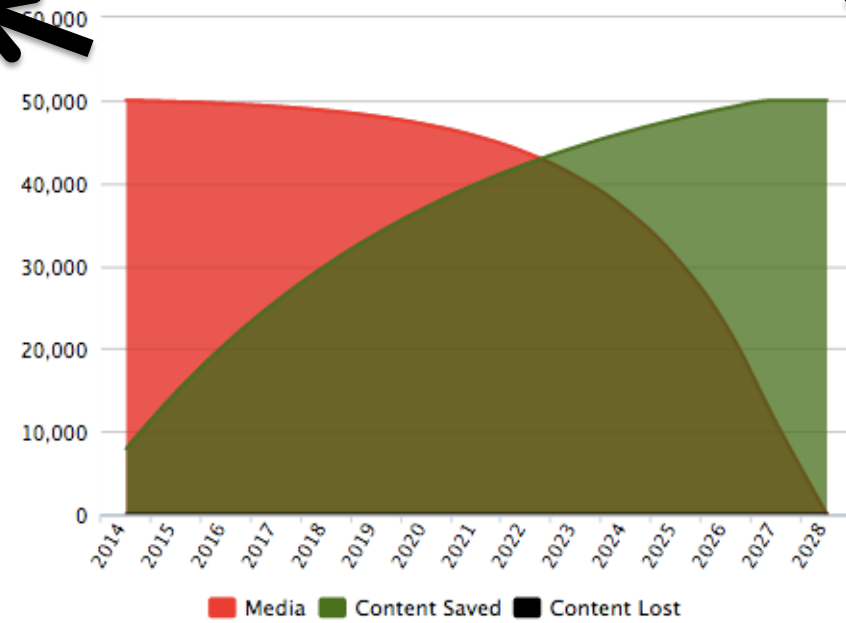
[Save](#) [Get Link](#)  

Last year for magnetic media? <b>2028</b>	Number of objects in collection? <b>50,000</b>	Collection's audio-video percentage? 50% Video 50% Audio	Investment to date for media? <b>\$4,500,000</b>	Annual cost per media item moving forward? <b>\$3</b>	Digitization cost per <b>\$60</b>
Year you will start digitizing items? <b>2014</b>	Annual digitization <b>\$475,000</b>	Storage service? <b>Amazon -</b>	Annual decrease in cost of storage? <b>15%</b>	Annual increase in cost of digitization? <b>16%</b>	

### Investment Analysis



### Item and Accessibility Analysis



### Key Findings

Investment saved per \$1 of expense

**\$0.74**

Return

**73.75%**

Investment Lost

**\$0**

Content Lost

**0**



Export to CSV



Year	Media	Content Saved	Excess Items Digitized	Investment Made	Content Lost	Investment Lost	Investment Saved	Digitization Expense	Storage Expense	Digitization + Storage Expense	Investment Saved per \$1 of expense	Quality of Selection
2014	50,000	7,917	7,747	\$4,500,000	0	\$3,787,500	\$712,500	\$475,000	\$113,993	\$588,993	\$1.21	100.00%
2015	49,831	14,741	6,583	\$4,650,000	0	\$3,279,052	\$1,370,948	\$950,000	\$294,417	\$1,244,417	\$1.10	99.66%
2016	49,589	20,625	5,540	\$4,800,000	0	\$2,820,024	\$1,979,976	\$1,425,000	\$508,984	\$1,933,984	\$1.02	99.18%
2017	49,246	25,697	4,583	\$4,950,000	0	\$2,406,034	\$2,543,966	\$1,900,000	\$736,216	\$2,636,216	\$0.97	98.49%
2018	48,756	30,069	3,676	\$5,100,000	0	\$2,032,969	\$3,067,031	\$2,375,000	\$962,228	\$3,337,228	\$0.92	97.51%
2019	48,060	33,838	2,778	\$5,250,000	0	\$1,696,993	\$3,553,007	\$2,850,000	\$1,178,419	\$4,028,419	\$0.88	96.12%
2020	47,068	37,087	1,838	\$5,400,000	0	\$1,394,551	\$4,005,449	\$3,325,000	\$1,379,828	\$4,704,828	\$0.85	94.14%
2021	45,657	39,889	791	\$5,550,000	0	\$1,122,361	\$4,427,639	\$3,800,000	\$1,563,955	\$5,363,955	\$0.83	91.31%
2022	43,647	42,303	0	\$5,700,000	0	\$877,409	\$4,822,591	\$4,275,000	\$1,729,938	\$6,004,938	\$0.80	87.29%
2023	40,785	44,385	0	\$5,850,000	0	\$656,939	\$5,193,061	\$4,750,000	\$1,877,967	\$6,627,967	\$0.78	81.57%
2024	36,711	46,180	0	\$6,000,000	0	\$458,434	\$5,541,566	\$5,225,000	\$2,008,878	\$7,233,878	\$0.77	73.42%
2025	30,910	47,727	0	\$6,150,000	0	\$279,608	\$5,870,392	\$5,700,000	\$2,123,880	\$7,823,880	\$0.75	61.82%
2026	22,651	49,060	0	\$6,300,000	0	\$118,386	\$6,181,614	\$6,175,000	\$2,224,364	\$8,399,364	\$0.74	45.30%
2027	10,892	50,000	0	\$6,450,000	0	\$0	\$6,450,000	\$6,563,180	\$2,311,411	\$8,874,591	\$0.73	21.78%
2028	0	50,000	0	\$6,600,000	0	\$0	\$6,600,000	\$6,563,180	\$2,385,401	\$8,948,581	\$0.74	0.00%



### Enter your collection details

Save

Get Link



Last year for magnetic media?

2028

2015 2050

Number of objects in collection?

50,000

1 10,000,000

Collection's audio-video percentage?

50% Video

50% Audio

Investment to date for media?

\$4,500,000

\$1 \$100,000,000

Annual cost per media item moving forward?

\$3

\$0.01 \$20

Digitization cost per

\$60

\$0.01 \$10000

Year you will start digitizing items?

2014

2014 2028

Annual digitization

\$475,000

\$1 \$50,000,000

Storage service?

Amazon -

Annual decrease in cost of storage?

15%

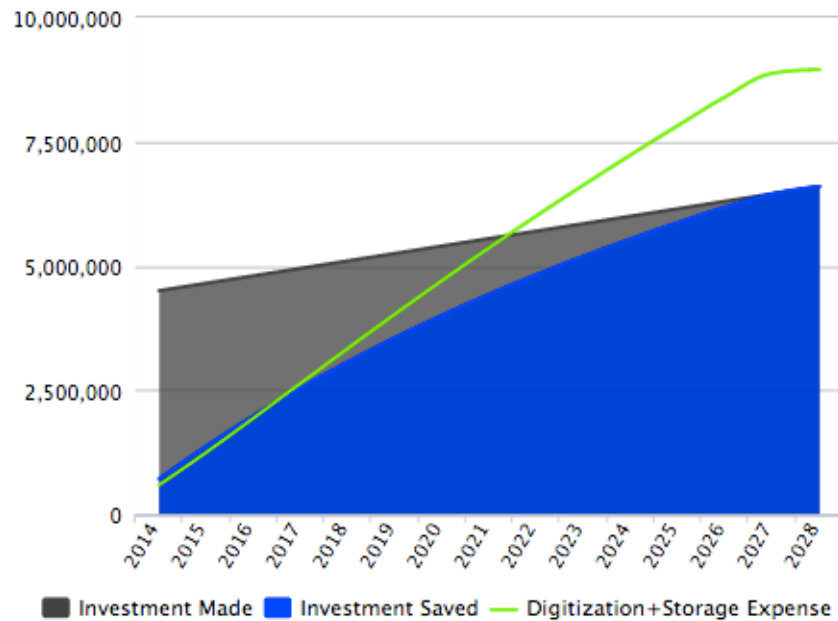
0% 100%

Annual increase in cost of digitization?

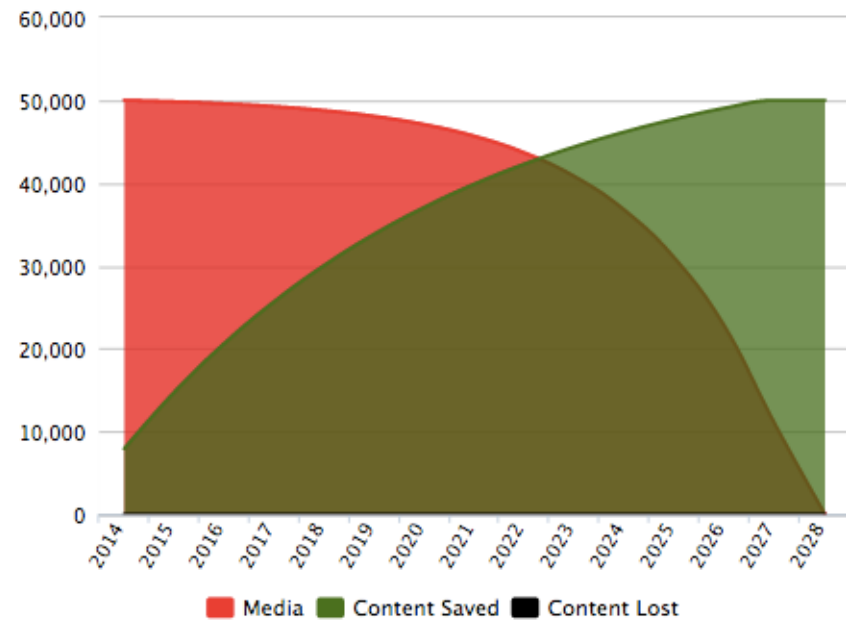
16%

0% 100%

### Investment Analysis



### Item and Accessibility Analysis





Save

Get Link



### Enter your collection details

Last year for magnetic media?

2028

2015 2050

Number of objects in collection?

50,000

1 10,000,000

Collection's audio-video percentage?

50% Video

50% Audio

Investment to date for media?

\$4,500,000

\$1 \$100,000,000

Annual cost per media item moving forward?

\$3

\$0.01 \$20

Digitization cost per

\$60

\$0.01 \$10000

Year you will start digitizing items?

2014

2014 2028

Annual digitization

\$475,000

\$1 \$50,000,000

Storage service?

Amazon -

Annual decrease in cost of storage?

15%

0% 100%

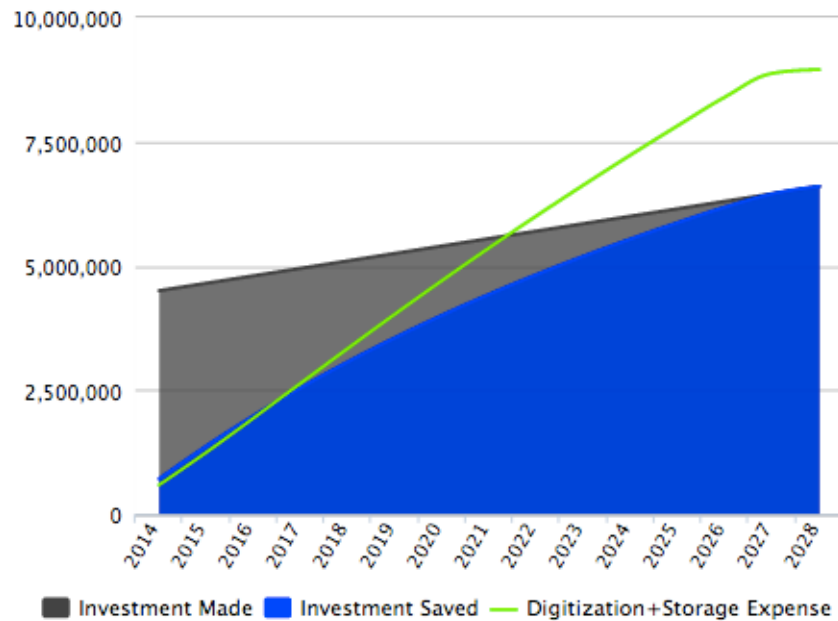
Annual increase in cost of digitization?

16%

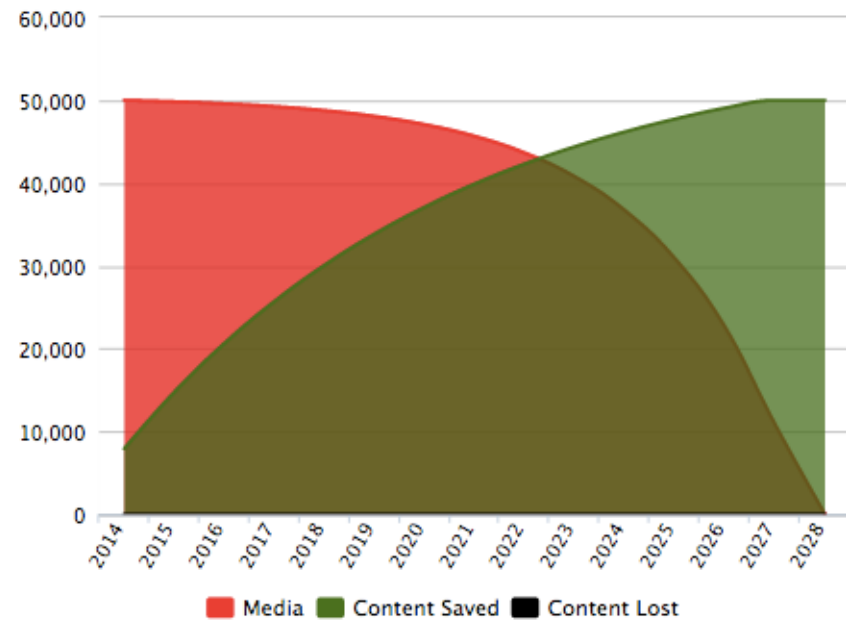
0% 100%



### Investment Analysis



### Item and Accessibility Analysis



## COLLECTION DETAIL PARAMETERS

---

This is the section where the user enters the details for a particular scenario. Multiple scenarios can be saved in order to perform comparative analysis of various possible paths.

### **Last year of magnetic media:**

The year that we will lose physical AV materials to obsolescence and degradation, meaning that it will be too costly to digitize at scale with sufficient quality. Expert consensus places this between 2023 and 2028.

### **Number of objects in collection**

This is the number of audiovisual items in the collection under review. Depending on the analysis you would like to perform, this may be all items in your collection regardless of priority for preservation, or it may be only the items that have been prioritized for preservation. As long as the other questions are answered with this same collection of materials in mind then everything should align accordingly.

### **Collection's audio-video percentage:**

To calculate storage costs we need to estimate how much data is being stored. We first do this by identifying the Collection's audio-video percentage. After this, the following assumptions are used:

Target formats for video: Preservation Master - Uncompressed, 10-bit, standard definition file; Mezzanine - 25Mbps file; Access copy - 5Mbps file. Average length of video item: 1 hour Size of all target formats for each video item: 121.1 GB

Target formats for audio: Preservation Master - Uncompressed 24-bit, 96kHz file; Mezzanine - Uncompressed 24-bit, 96kHz file; Access copy - 256kbps file Average length of audio item: 1 hour Size of all target formats for each audio item: 4.11 GB

[Top](#)

The number of items digitized are multiplied by the appropriate storage numbers in order to arrive at the total storage required in a given year. This is then multiplied by the underlying numbers in the "Storage service" and "Annual decrease in cost of storage" parameters in order to arrive at a storage cost.

### **Investment to date for media:**

Every organization that has a collection of media has invested in that media from the point of acquisition to the present. For a collecting institution these costs could include acquisition costs, curatorial staff, administrative and management staff, archivist and preservation staff, processing, description, reformatting, rehousing, moving, equipment, furniture, real estate, HVAC, software and hardware systems, provision of access, and more. For production oriented organizations you could include the cost of production and post production. Some organizations may choose to delve deeply into this in a great level of detail. Others may wish to take a simpler path by assigning a percentage of capital and operational expenses to audiovisual materials. Whatever method of calculation makes sense, a value for the investment made to date in physical audiovisual collections should be assigned here. One consideration when using a "Number of objects in the collection" that only represents items that are prioritized for preservation is whether or not to burden them fully with the cost to maintain all items over time. If the intent in collecting all of the materials was to ultimately produce the results represented by digitizing the items prioritized for preservation then it is arguable that the cost for making that happen included all of the collection activities and costs leading up to that.



How was the cost for Amazon storage calculated?

To start we used the following assumptions regarding target formats for digitization and the average length of audiovisual items:

Video:

- Preservation master: Uncompressed, 10-bit, standard definition file, totaling 105GB/hr
- Mezzanine: 25Mbps file, totaling 14GB/hr
- Access copy: 5Mbps file, totaling 2.1GB/hr
- Average length of video item: 1 hour
- Size of all target formats for each video item: 121.1 GB

Audio:

- Preservation master: Uncompressed 24-bit, 96kHz file, totaling 2GB/hr
- Mezzanine - Uncompressed 24-bit, 96kHz file, totaling 2GB/hr
- Access copy - 256kbps file, totaling .11GB/hr
- Average length of audio item: 1 hour
- Size of all target formats for each audio item: 4.11 GB

For Amazon we assumed that all preservation masters would be stored on Glacier and all Mezzanine and Access copies would be stored on S3. We then ran several scenarios using the Amazon pricing calculators (<http://calculator.s3.amazonaws.com/index.html> - with "FREE USAGE TIER: New Customers get free usage tier for first 12 months" unchecked). The assumptions and results can be seen in the table below. Top

**Base Scenario:** 50,000 hours 50% video and 50% audio  
**Date:** 4/9/2014

Total Items/Hours	50,000
Percentage of Audio	50.00%

	Video	Audio	Combined	25% lower	6% lower	100% more
Hours	25,000	25,000	50,000	12,500	3,125	100,000
PM on Glacier GB	2,625,000	50,000	2,675,000	668,750	167,188	5,350,000
Mezz and AC on S3 GB	402,500	52,750	455,250	113,813	28,453	910,500

S3 Settings						
S3 PUT/COPY/POST/LIST Requests	500,000	500,000	1,000,000	250,000	62,500	2,000,000
S3 GET and Other Requests	500,000	500,000	1,000,000	250,000	62,500	2,000,000
S3 data retrieved per month - percentage of total content in S3	5%	5%	5%	5%	5%	5%
S3 data retrieved per month	20,125	2,638	22,763	5,691	1,423	45,525

Glacier Settings						
Glacier UPLOAD and RETRIEVAL requests per month	500,000	500,000	1,000,000	250,000	62,500	2,000,000



63,050 UNDIGITIZED, PRESERVATION WORTHY PHYSICAL AV ITEMS

63,050 UNDIGITIZED, PRESERVATION WORTHY PHYSICAL AV ITEMS

40% VIDEO / 60% AUDIO

63,050 UNDIGITIZED, PRESERVATION WORTHY PHYSICAL AV ITEMS

40% VIDEO / 60% AUDIO

\$11M SPENT TO DATE BY ARCHIVE

63,050 UNDIGITIZED, PRESERVATION WORTHY PHYSICAL AV ITEMS

40% VIDEO / 60% AUDIO

\$11M SPENT TO DATE BY ARCHIVE

\$2 PER ITEM PER YEAR MOVING FORWARD

63,050 UNDIGITIZED, PRESERVATION WORTHY PHYSICAL AV ITEMS

40% VIDEO / 60% AUDIO

\$11M SPENT TO DATE BY ARCHIVE

\$2 PER ITEM PER YEAR MOVING FORWARD

\$60 PER ITEM FOR DIGITIZATION

# 3 SCENARIOS

**100% Scenario:** Digitizing 100% of the 63050 items,  
beginning in 2014

---

**\$300k Scenario:** Being given a budget of \$300k per year,  
beginning in 2014

---

**2014 v 2020 Scenario:** Implications of starting in 2014  
compared to 2020.

---

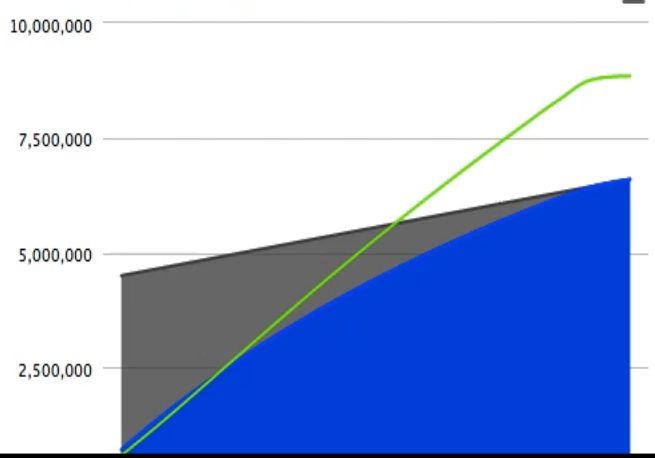
### Enter your collection details

Save Get Link

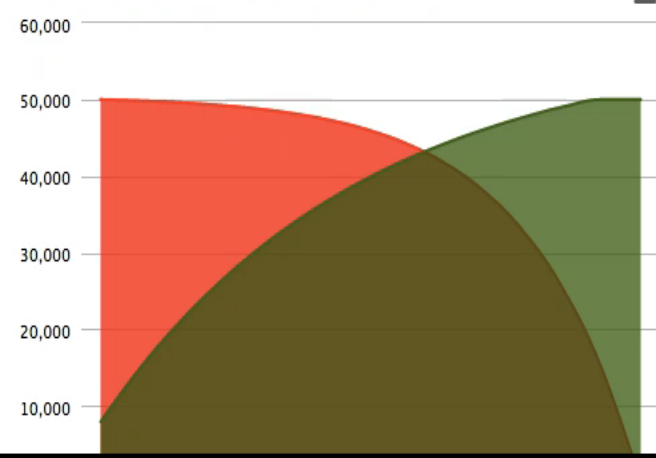
Last year for magnetic media? <b>2028</b>	Number of objects in collection? <b>50,000</b>	Collection's audio-video percentage? 50% Video 50% Audio	Investment to date for media? <b>\$4,500,000</b>	Annual cost per media item moving forward? <b>\$3.00</b>	Digitization cost per item? <b>\$60.00</b>
Year you will start digitizing items? <b>2014</b>	Annual digitization budget? <b>\$475,000</b>	Storage service? <b>Amazon</b>	Annual decrease in cost of storage? <b>15%</b>	Annual increase in cost of digitization? <b>16%</b>	

Collection Analysis Start Implications

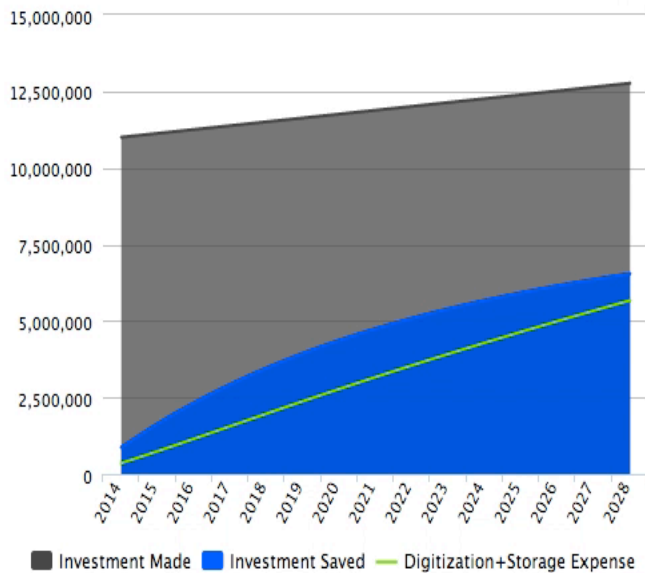
### Investment Analysis



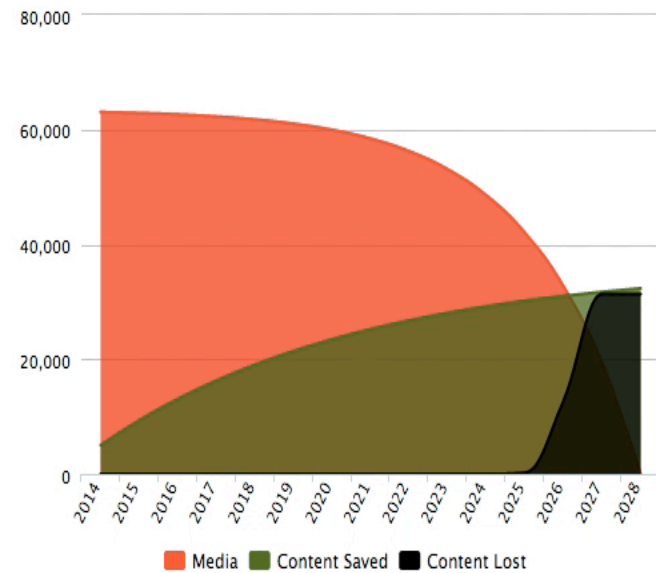
### Item and Accessibility Analysis



### Investment Analysis



### Item and Accessibility Analysis



### Key Findings

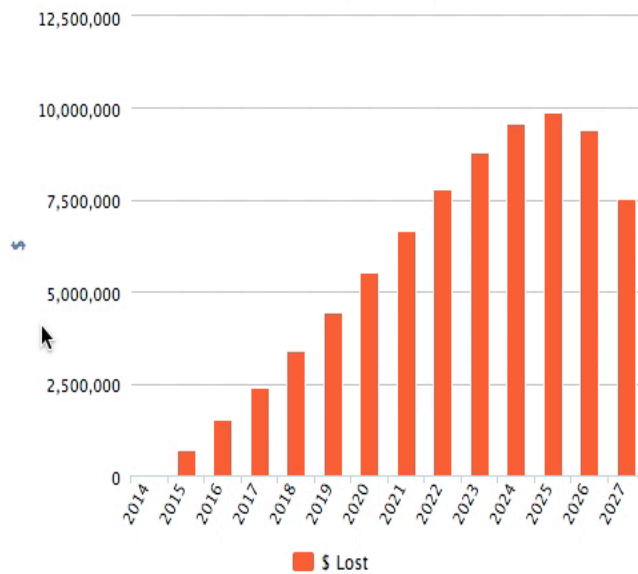
Investment saved per \$1 of expense	Return	Investment Lost	Content Lost
<b>\$1.15</b>	<b>115.41%</b>	<b>\$6,218,168</b>	<b>31,338</b>

[Export to CSV](#)

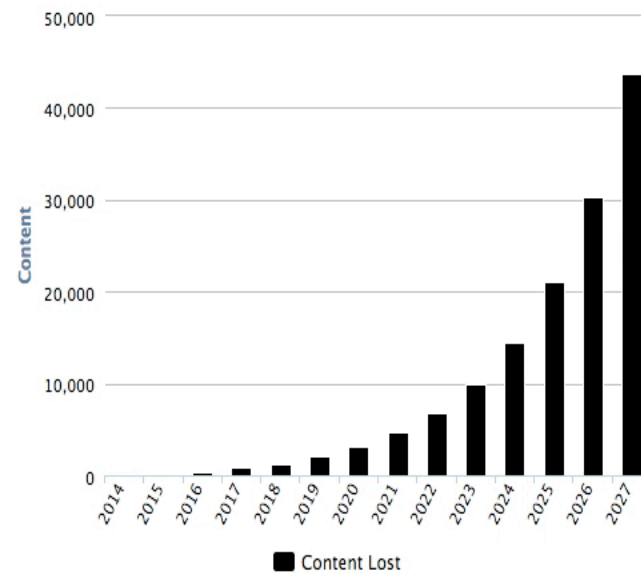
Year	Media	Content Saved	Excess Items Digitized	Investment Made	Content Lost	Investment Lost	Investment Saved	Digitization Expense	Storage Expense	Digitization + Storage Expense	Investment Saved per \$1 of expense	Quality of Selection
2014	63,050	5,000	4,826	\$11,000,000	0	\$10,127,676	\$872,324	\$300,000	\$55,997	\$355,997	\$2.45	100.00%
2015	62,876	9,310	4,060	\$11,126,100	0	\$9,483,153	\$1,642,947	\$600,000	\$144,626	\$744,626	\$2.21	99.72%



### Additional Money Spent/Lost by Starting Later



### Additional Content Lost by Starting Later



Export to CSV

Year Digitization Started	Annual Digitization Budget Required	Storage Cost by 2028	Total Spent by 2028	Investment Lost by 2028	Spent + Lost by 2028	Spent + Lost Difference	Content Lost	% More Spent + Lost	% More Content Lost
2014	\$596,469	\$954,745	\$9,305,311	\$0	\$9,305,311	\$0	0	0.00%	0.00%
2015	\$706,159	\$801,767	\$9,981,834	\$35,314	\$10,017,148	\$711,837	174	7.65%	0.28%
2016	\$838,680	\$671,128	\$10,735,288	\$86,026	\$10,821,314	\$1,516,003	425	16.29%	0.67%

# 100% SCENARIO (\$600K)

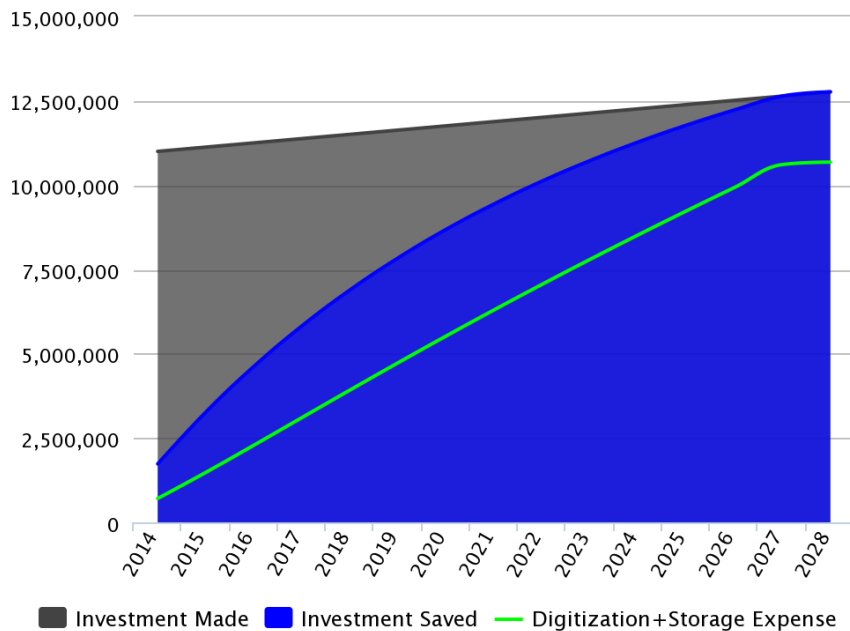
Digitization + Storage Expense: \$10.68M

Investment saved per \$1 of Expense: \$1.20

Investment Saved: \$12.76M

Investment Lost: \$0

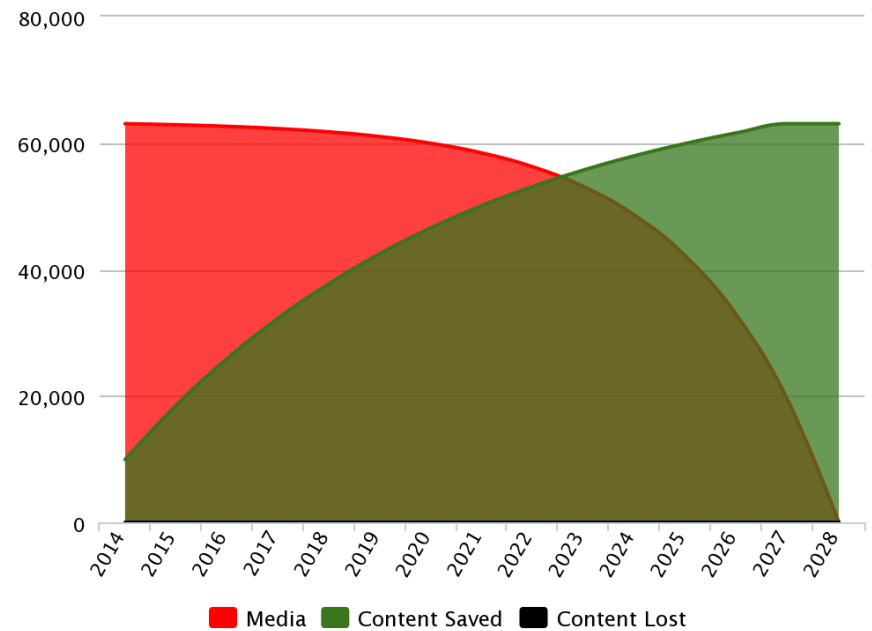
Investment Analysis



Content Saved: 63,050

Content Lost: 0

Item and Accessibility Analysis



# \$300K SCENARIO

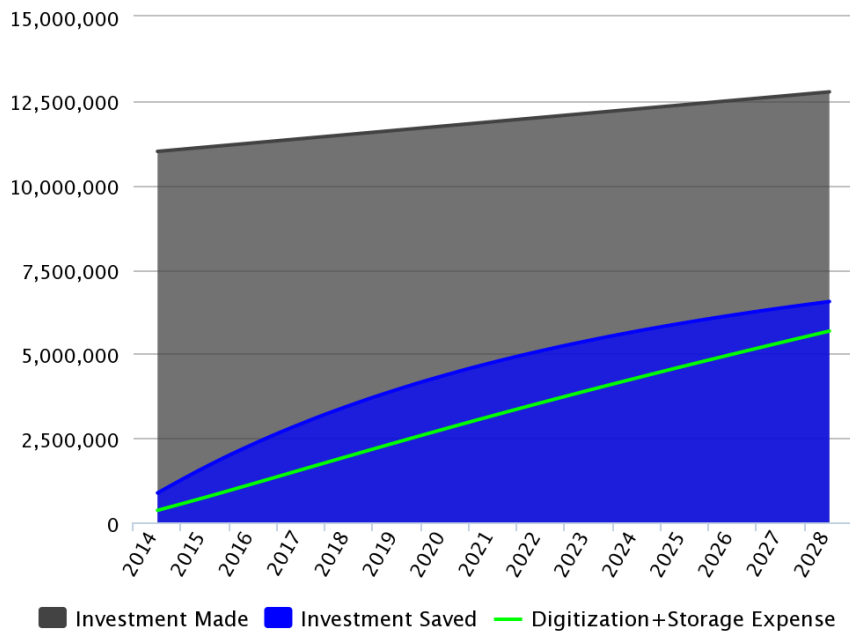
Digitization + Storage Expense: \$5.6M

Investment saved per \$1 of Expense: \$1.15

Investment Saved: \$6.5M

Investment Lost: \$6.2M

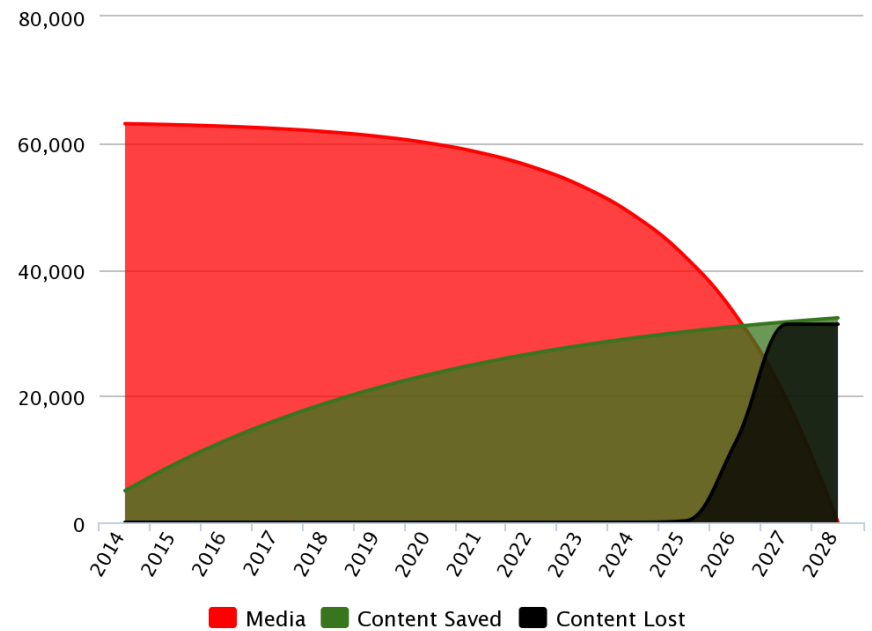
Investment Analysis



Content Saved: 31,712

Content Lost: 31,338

Item and Accessibility Analysis



# 2014 \$600K SCENARIO

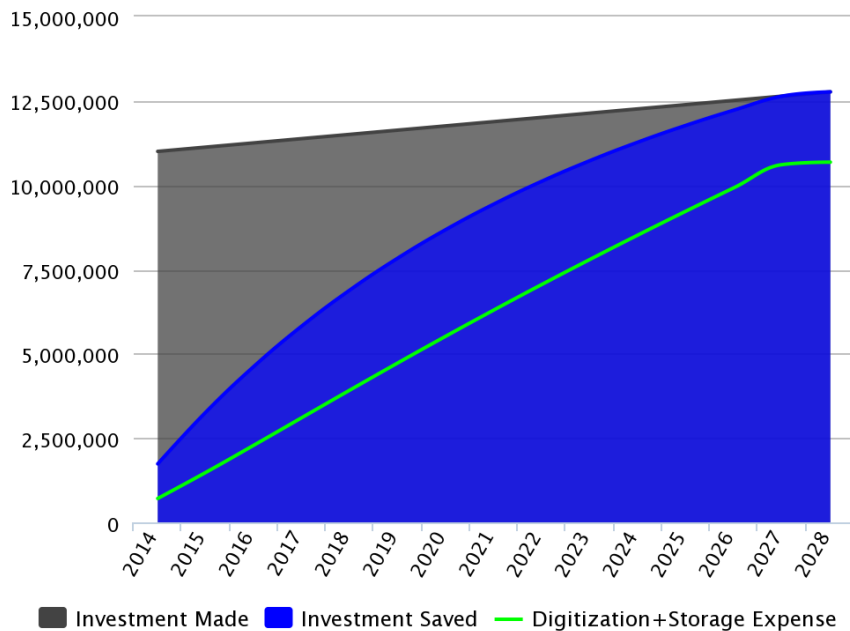
Digitization + Storage Expense: \$10.68M

Investment saved per \$1 of Expense: \$1.20

Investment Saved: \$12.76M

Investment Lost: \$0

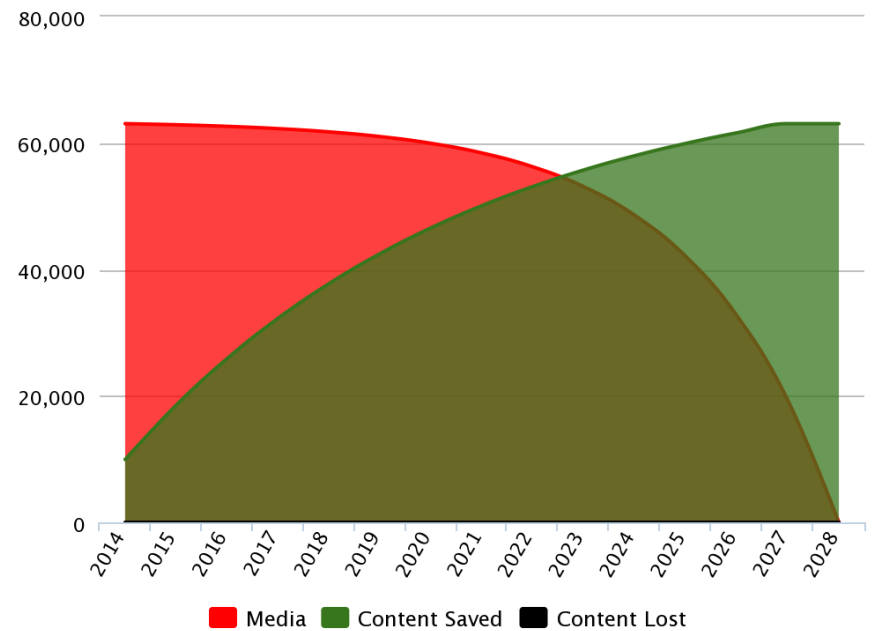
Investment Analysis



Content Saved: 63,050

Content Lost: 0

Item and Accessibility Analysis



# 2020 \$600K SCENARIO

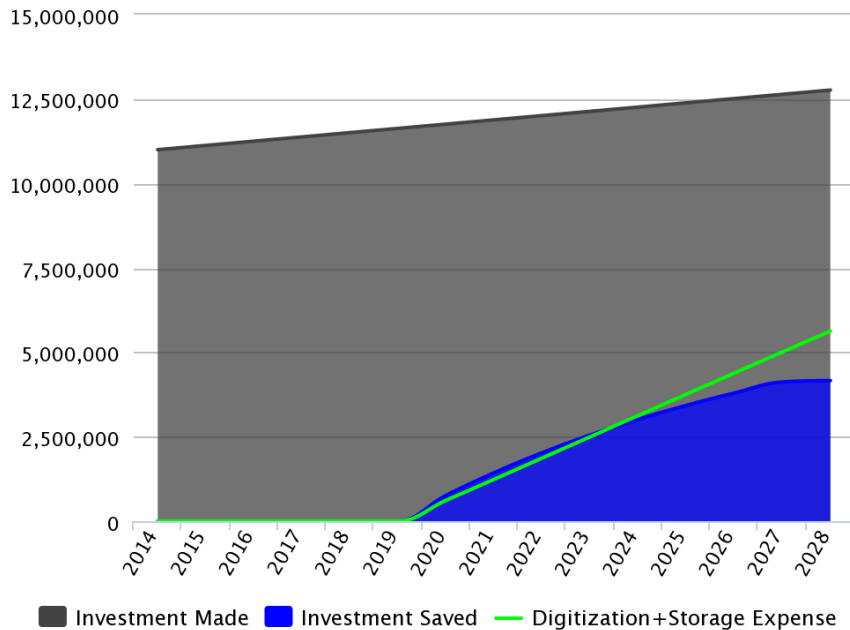
Digitization + Storage Expense: \$5.62M

Investment saved per \$1 of Expense: \$0.74

Investment Saved: \$4.1M

Investment Lost: \$8.6M

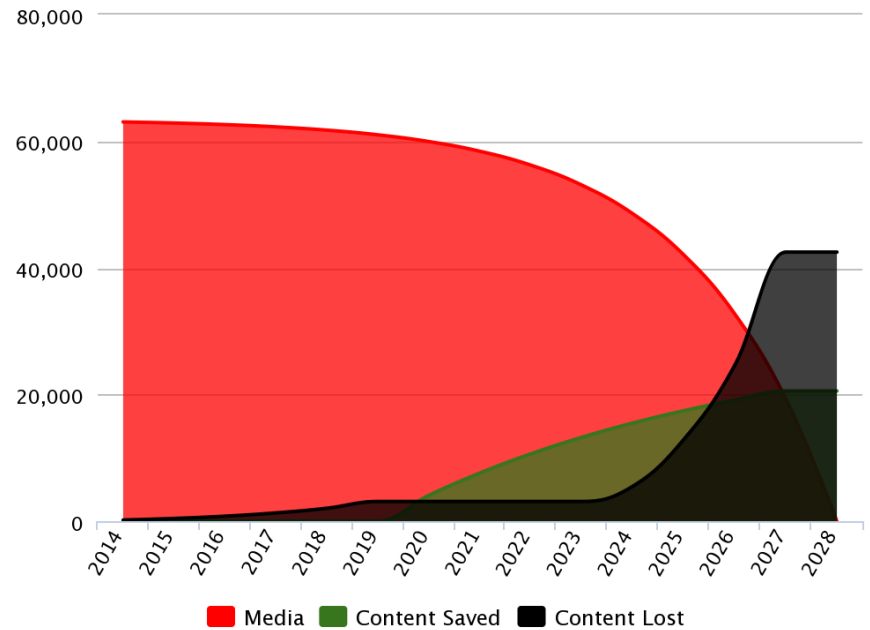
Investment Analysis



Content Saved: 20,559

Content Lost: 42,491

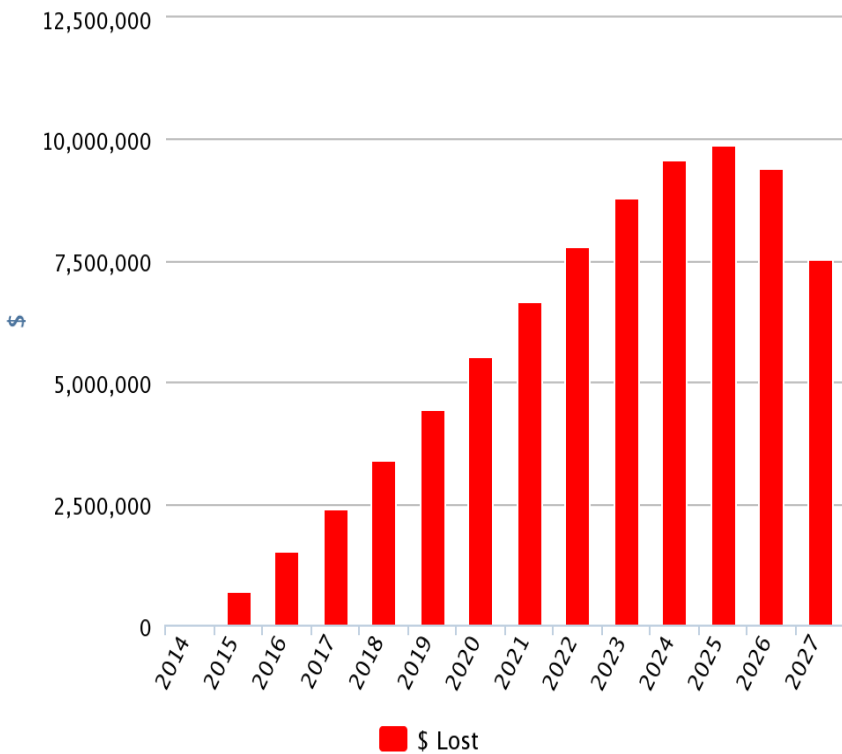
Item and Accessibility Analysis



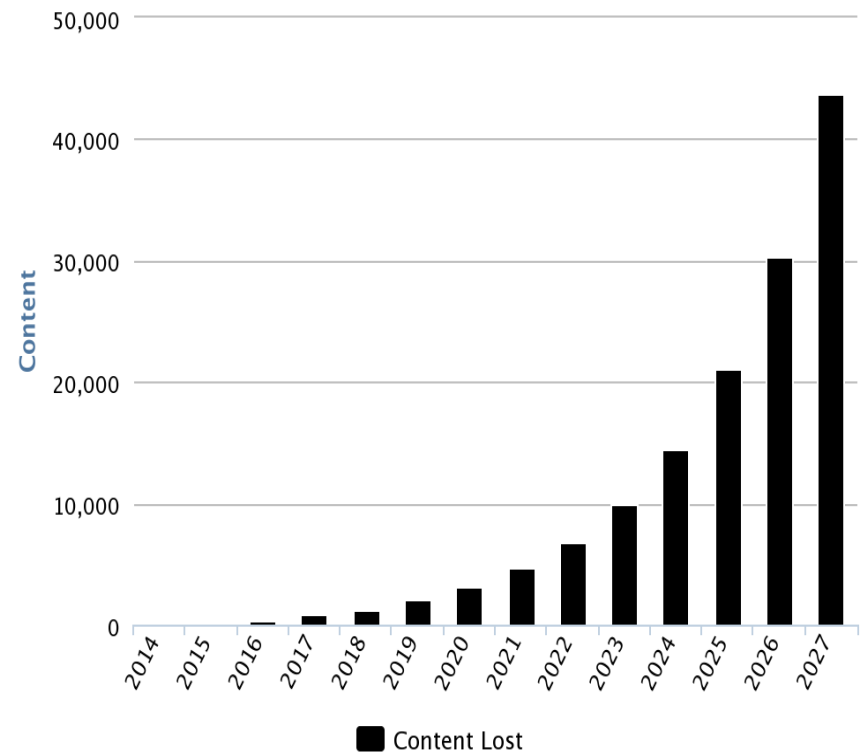
# START IMPLICATIONS

Year	Annual Digitization Budget	Spent + Lost Difference	Content Lost
2014	\$596,469	\$0	0
2020	\$1,739,092	\$5,547,418	3,108

Additional Money Spent/Lost by Starting Later



Additional Content Lost by Starting Later



OTHER

---

CONSIDER

---

RATIONS

---

Lack of access &  
discoverability

## List of rediscovered films

From Wikipedia, the free encyclopedia



This article **needs additional citations** for it may be **challenged** and **removed**. (February 2013)

## NASA reacquires original Moon landing footage Tapes discovered in Oz, agency confirms

This is a **list of rediscovered films** that, once thought *lost*, have since been discovered.


### Contents [hide]

- 1 Silent era
  - 1.1 1890s
  - 1.2 1900s
  - 1.3 1910s
  - 1.4 1920s
- 2 Sound era
  - 2.1 1930s
  - 2.2 1940s
  - 2.3 1950s
  - 2.4 1960s
  - 2.5 1970s
  - 2.6 1980s
  - 2.7 1990s
- 3 See also
- 4 References
- 5 External links



## A 1973 Bowie performance thought lost is aired

January 18, 2013 18:53

 [Paul McCartney news RSS Feed](#)

## Rare Paul McCartney recording found on lost tape

*Discovery captures Beatle performing 1964 Peter And Gordon hit 'A World Without Love'*

**theguardian**

[News](#) | [US](#) | [World](#) | [Sports](#) | [Comment](#) | [Culture](#) | [Busines](#)

[Culture](#) > [Film](#) > [Metropolis](#)

## Missing scenes from Fritz Lang's Metropolis turn up after 80 years



OTHER

---

CONSIDER

---

RATIONS

---

Lack of access &  
discoverability

Impact to Reputation

OTHER

---

CONSIDER

---

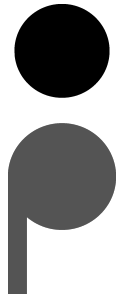
RATIONS

---

Lack of access &  
discoverability

Impact to Reputation

Direct vs. Indirect  
monetization



[coi.avpreserve.com](https://coi.avpreserve.com)