Pre-Ingest processing for digital archival records

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Library and Archives Canada (LAC)

Library and Archives Canada

LAC is both a national library and a national archives

Broad mandate:

- to **preserve** the documentary heritage of Canada for the benefit of present and future generations
- to be a source of enduring knowledge accessible to all, contributing to the cultural, social and economic advancement of Canada as a free and democratic society
- to facilitate in Canada co-operation among communities involved in the acquisition, preservation and diffusion of knowledge
- to serve as the continuing memory of the Government of Canada and its institutions

What is Pre-Ingest?

Pre-Ingest = Technical Appraisal

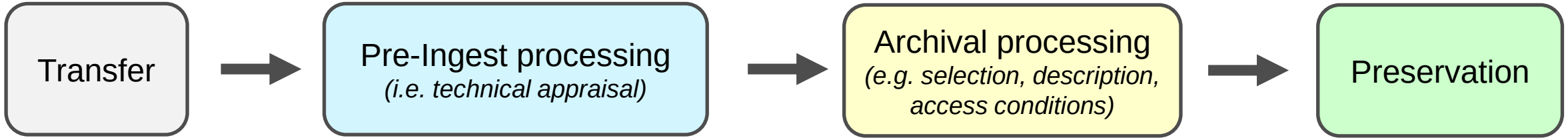
- Performed on digital archival records
- First stage of processing transferred digital records at LAC
  - Occurs post-transfer but prior to content being under the care of LAC's Digital Preservation section
  - Occurs before selection, arrangement & description by archival staff

Why do we need Pre-Ingest?

- Two key reasons:
  - Not every transfer is ready for preservation as-is
  - We may not want to keep everything transferred to us
- Context of government vs private transfers
- Pre-Ingest allows us to:
  - Know the nature of transferred digital records
  - Understand where digital preservation requirements are not met
  - Make informed decisions about what to preserve and how to preserve it

Where does Pre-Ingest fit?

A high-level overview of where Pre-Ingest processing falls within the overall processing workflow:



How do we do Pre-Ingest?

Pre-Ingest Workflow

What is pre-ingest?

Pre-ingest is the technological review of digital records transferred
software tools to automate the process. The goal of pre-ingest is t
preservation policies and that which LAC has a reasonable success
for the long-term.

What are the major tasks are for pre-ingest?

- Weed any digital records that should not have transferred
configuration, developmental, temporary, software files e
- Identify file format or other[2] issues that need addressing p
archival staff.

What resources and documentation are available to help me bette

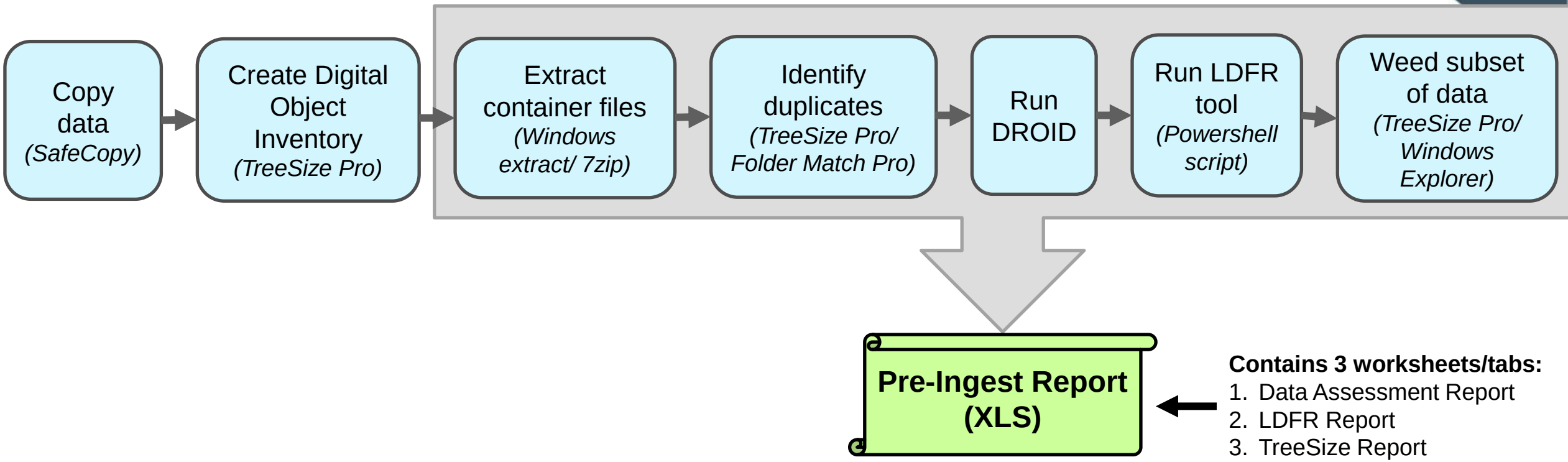
Prior to undertaking training on pre-ingest, it is requested that you

1. The Training PowerPoint (FR / EN) for the Procedures f
been added to the slides.
2. The suite of documents related to the Procedures for

#☒	Task	Notes
3.1 ☐	Complete Digital Object Inventory spreadsheet	• Use TreeSize Pro to create a digital object listing of all the See TreeSize Pro Help Sheet (FR / EN) for directions on ho • Either reformat the TreeSize Pro export to match the Digi or copy and paste the output from TreeSize Pro into the D • Name or rename the Digital Object Inventory after the Re Inventory_2016-5468.xlsx)

3.2 ☐	Run DROID on entire registration	• Create a DROID export (*.CSV) for all of the content in the
		• Note – if the volume of content transferred is very large (
		very long time to complete
		  ○ In order to manage this, DROID can be run on on
		  be run on smaller subsets of the data resulting in
		  ○ Alternatively, if you are confident in the assessme
		  file format extension) – a judgmental call may be
		  identified by TreeSize Pro (via a copy of that cont
		• See DROID Help Sheet for info on how to use the softwar

How do we do Pre-Ingest?



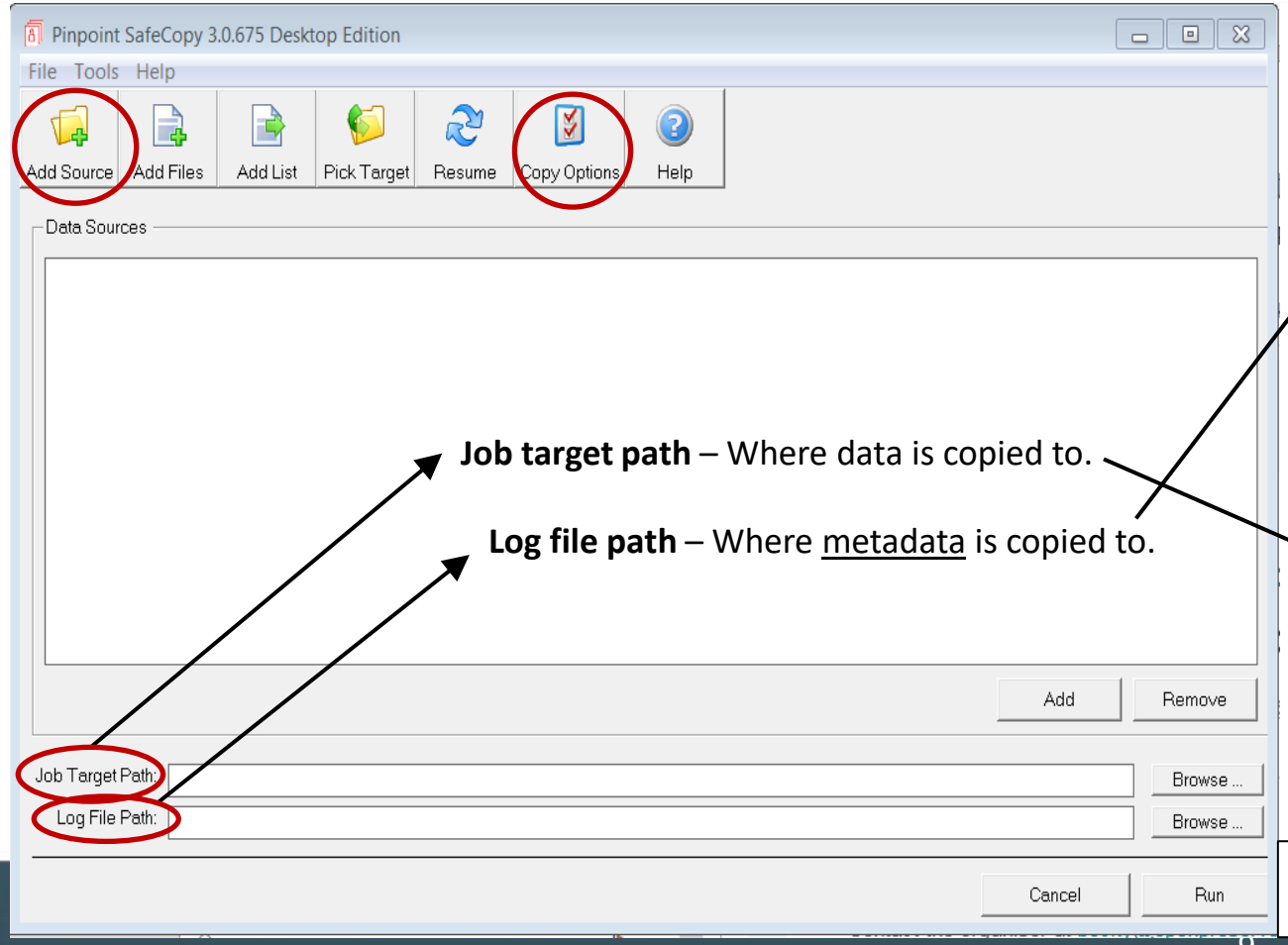
Contains 3 worksheets/tabs:

1. Data Assessment Report
2. LDFR Report
3. TreeSize Report

How do we do Pre-Ingest?

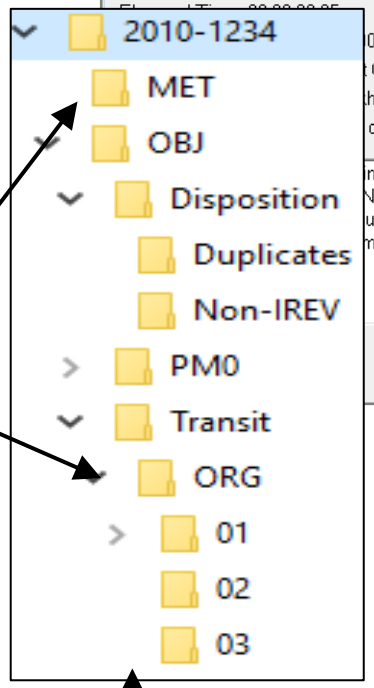
Main categories	Description	Software used	Outputs
1. Review of Pre-ingest request	• Check for missing work/info which is required prior to starting Pre-Ingest *e.g. Inventory of physical carriers in transfer, creation of a processing workspace to copy the date*	N/A	Email if additional work is needed
2. Data copying	• Anti-virus • Checksums (MD5) • Maintain time & date stamps when possible • Troubleshoot issues as needed	• SafeCopy • TeraCopy • MD5summer • Fsum Frontend • Mac Checksum	• Copy log metadata (CSV) • Screenshot of virus warnings if present (JPG) • Physical Carrier Inventory (XLS)
3. Pre-Ingest analysis (aka “Technical Appraisal”)	• Identify file formats • Categorize formats based on format & current LAC capacity • Weed subset of content (i.e. system/application files – content donor or government institution did not create or interact with & which is not critical to the rendering/functionality of digital archival records)	• DROID • LAC’s LDFR tool • TreeSize Pro • 7zip / Windows extract • QuickView Plus • Libre Office • Passware Analyzer	• Duplicate listing (XLS) • Password & encrypted file listing (CSV) • DROID report (CSV) • LDFR tool results (TXT) • Pre-Ingest Report (XLS)
4. Communicate with archival clients	• Brief archival staff on Pre-Ingest results (email/meeting) • Highlight next steps & any pertinent issues to consider for archival processing • Manage expectations from a digital preservation POV		• Email messages • MS Teams meetings

Data copying - SafeCopy

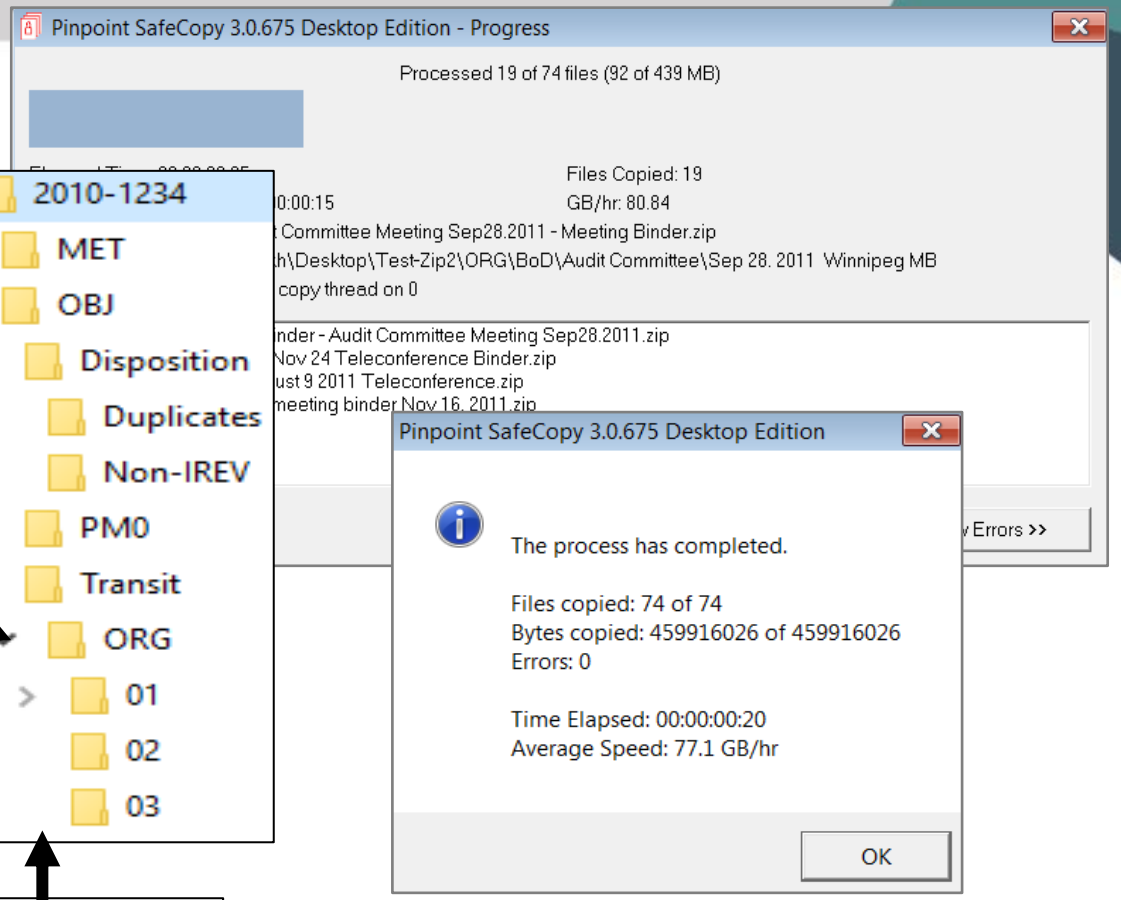


Job target path – Where data is copied to.

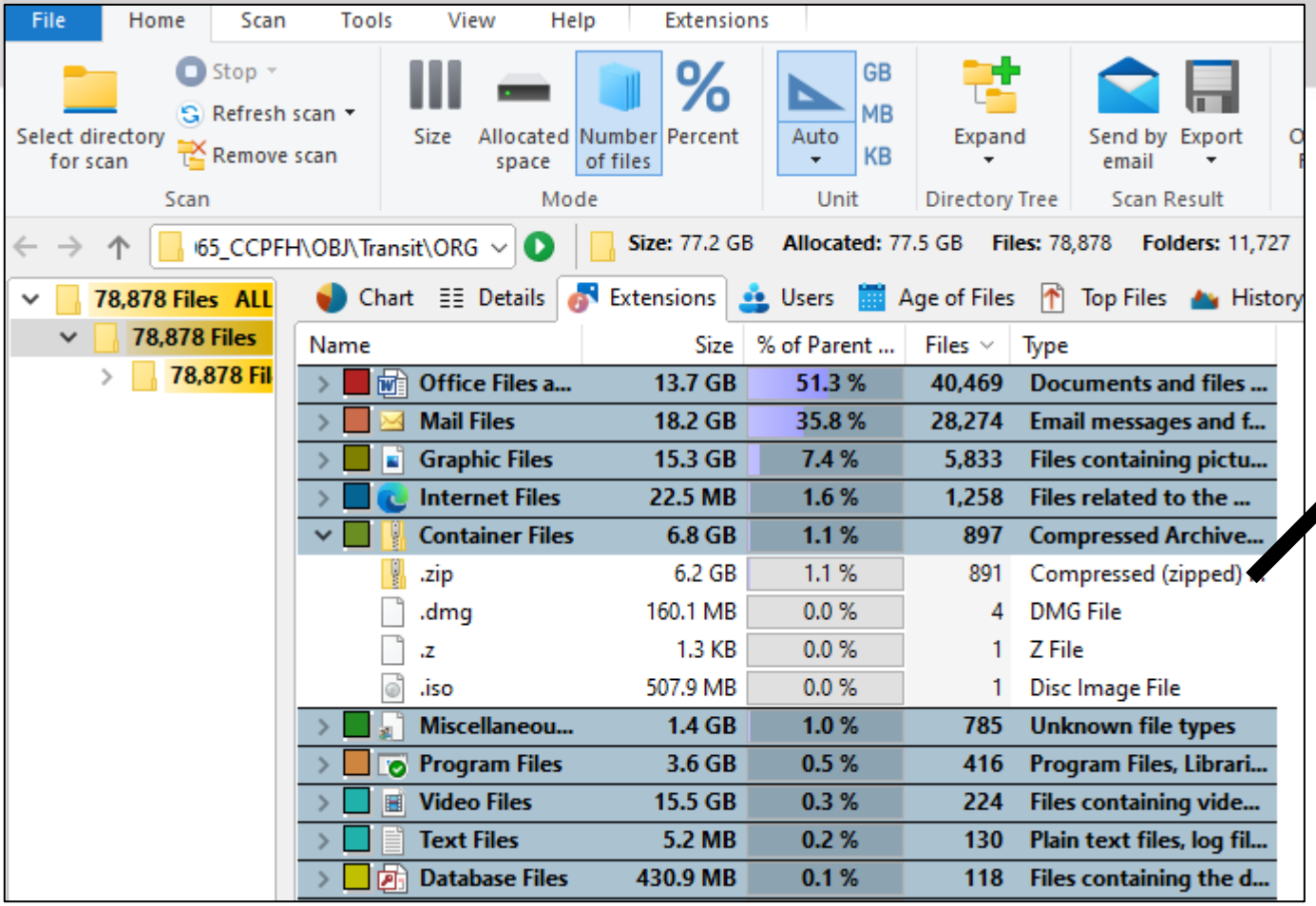
Log file path – Where metadata is copied to.

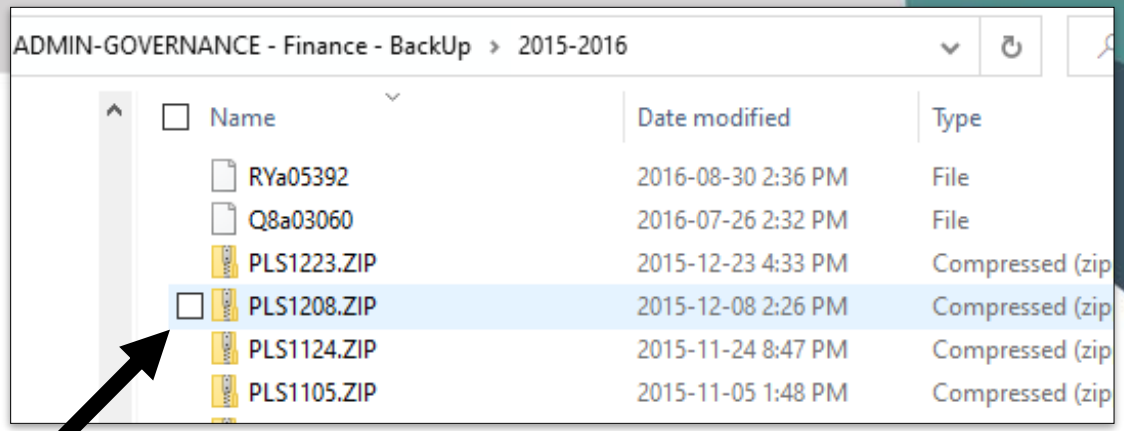


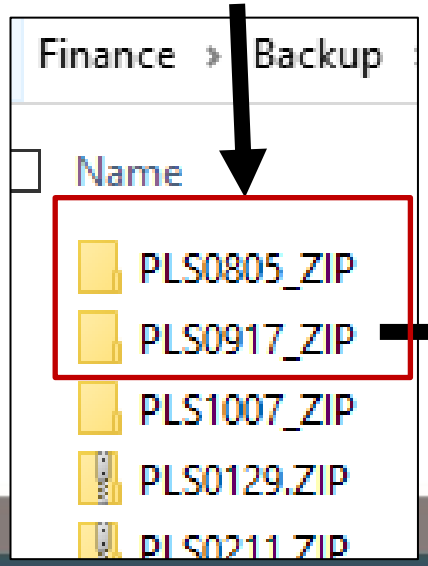
Digital processing workspace

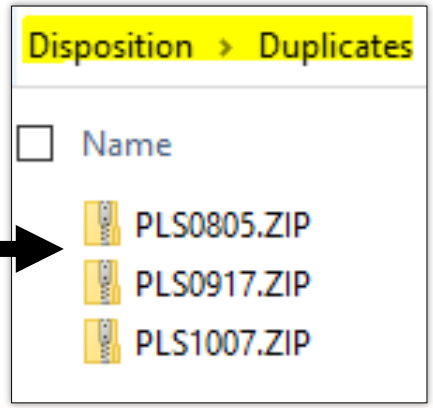


Technical Appraisal – Container files & TreeSize Pro

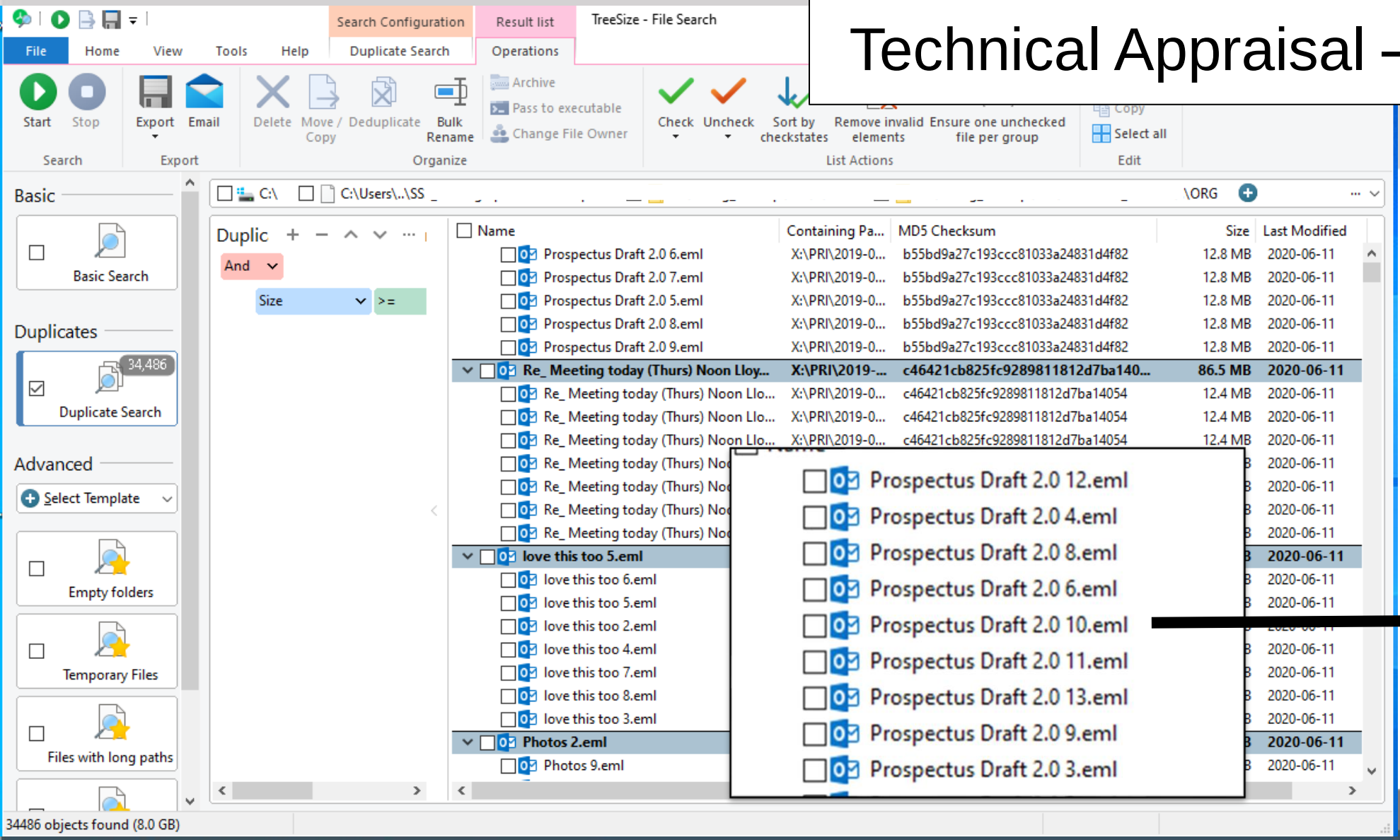




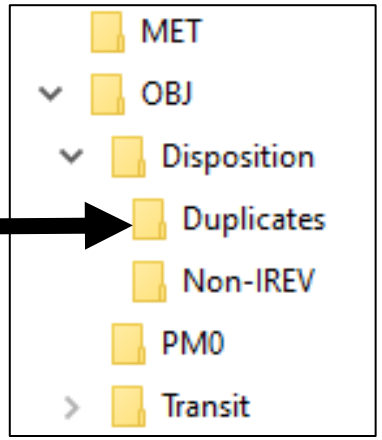




Technical Appraisal – Duplicates



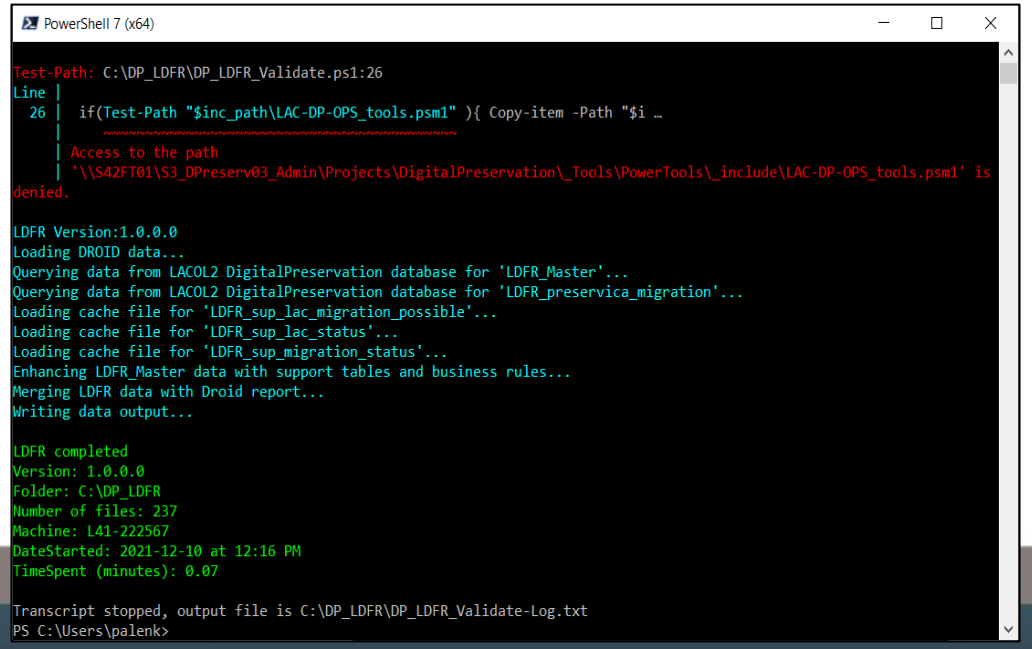
Duplicates search using checksums & TreeSize Pro and/or FolderMatch Pro



Technical Appraisal – File Formats

Use DROID to identify file formats & results exported to CSV

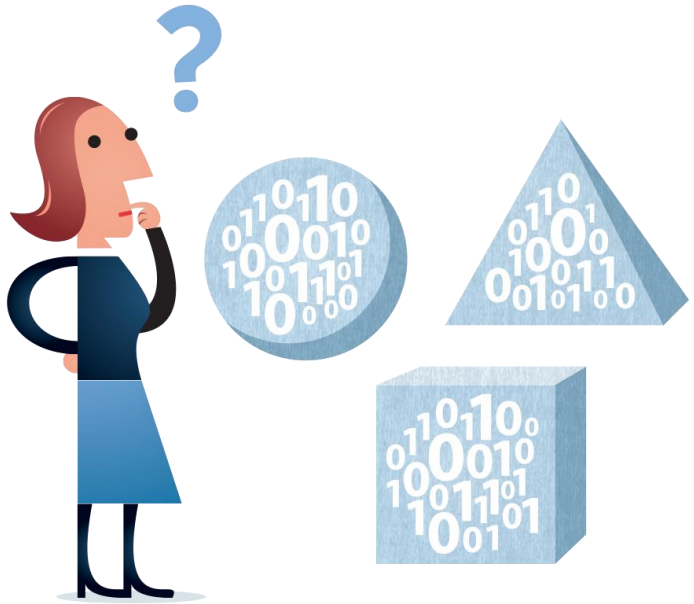
- Past approach → Manual review of formats
- Current approach (2022) → Automated analysis with LAC created LDFR tool
  - LDFR = Local Digital Format Registry
  - Developed by LAC's Digital Preservation section



Technical Appraisal –File Formats & LDFR Tool

LAC's LDFR tool is a registry of file formats. It includes:

- **LAC's current policy decision on file formats:** e.g. preferred, acceptable, tolerable, not eligible
- **LAC's current capability to manage** said formats



Digitalbevaring.dk

What are the LDFR categories?

Six main categories:

Category	Description
Preferred	No preservation action needed – file format ok as-is
Acceptable	File format can be auto-migrated
Tolerable	File format can be migrated manually
Assessment required	File format has PUID but is new to LAC – research required to determine LAC policy
Cannot assess	File format does not have a PUID or can only be identified by extension – requires digital object level analysis (i.e. 1 by 1 research)
Not eligible	File format is not eligible for preservation

LDFR tool results

LDFR - summary

DIM	File Count	Size (GB)	Distinct Format(s) Count
A-PREFERRED	74	0.1	5
B-ACCEPTABLE AUTO MIGRATION	122,546	229.9	25
C-TOLERABLE MANUAL MIGRATION	9	0.0	5
D-NOT ELIGIBLE FOR DP	89	0.0	6
X-ASSESSMENT REQUIRED	2,237	0.0	18
Z-CANNOT ASSESS	29,611	47.5	13

LDFR - details

DIM	File Count	Size (GB)	Distinct Format(s) Count
A-PREFERRED	74	0.1	5
- A0-No Action Needed	74	0.1	5
B-ACCEPTABLE AUTO MIGRATION	122,546	229.9	25
- B1-ACCEPTABLE / Tested Automated Migration	122,546	229.9	25
C-TOLERABLE MANUAL MIGRATION	9	0.0	5
- C1-TOLERABLE / Requires DP staff to Migrate	9	0.0	5
D-NOT ELIGIBLE FOR DP	89	0.0	6
- D1-Non-Archival content files (detected by fileName)	8	0.0	1
- D4-Zero Bytes Files	44	0.0	3
- D5-Else	37	0.0	2
X-ASSESSMENT REQUIRED	2,237	0.0	18
- X1-HAS PUID / UNKNOWN requires analysis	2,215	0.0	15
- X2-Has PUID - Missing in LDFR	22	0.0	3
Z-CANNOT ASSESS	29,611	47.5	13
- Z0-NO PUID Unknown File Format	29,181	47.5	1
- Z1-failed characterization (not signature or container)	430	0.0	12

Pre-Ingest Report

- 1 - Formulaire d'inventaire de supports p
- 1 - Physical Carrier Inventory.xlsx
- 2 - Digital Object Inventory.xlsx
- 2 - Formulaire d'inventaire d'objets num
- 3 - Pre-Ingest Report.xlsx
- 3 - Rapport sur le processus de la pré-ing
- 4 - Quality Assurance Report.xlsx
- 4 - Rapport sur l'assurance de la qualité d

Contains 3 worksheets/tabs:

1. Data Assessment Report
2. LDFR Report
3. TreeSize (content categories) Report

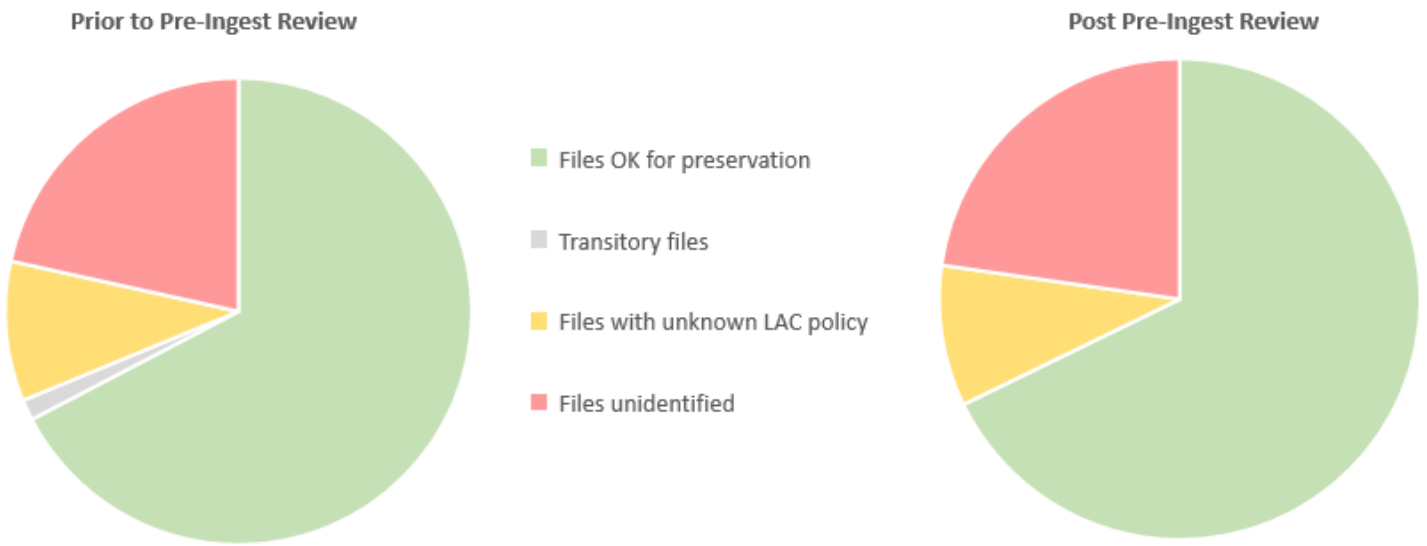
Data Assessment Report (Raw data is in LDFR Report tab)

This report assesses the data quality of transferred content. It is based on DROID software and the PRONOM database (an authoritative tool for file format identification).
The results categorize the data into 1 of 4 categories depending on LAC file format policy and LAC's current ability to render and/or migrate the data.

Registration #:	2020-XXXX	**Source:**	Private
Assessment by:	Heather Tompkins	**Donor/Department:**	Marc Richard
Archivst Contact:	P. Jones	**Data Location:**	\\s42cvma06\FS03-Projects_PreIng\PRI\2020-XXXX_Richard
Date of transfer to LAC:	2015-08-12		
Date of assessement:	2022-09-06		

Section 1. Results	Before Pre-Ingest Processing		After Pre-Ingest Processing	
Summary	Number of files	% of payload	Number of files	% of payload
Files OK for preservation	2,361	67.3%	2,221	67.8%
Transitory files	50	1.4%	0	0.0%
Files with unknown LAC policy	340	9.7%	310	9.5%
Files unidentified	755	21.5%	745	22.7%
Totals	3,506	100%	3,276	100%

	General Pre-Ingest Statistic Comparison	
	Before	After
Number of files	3506	3276
Number of folders	257	231
Total size	10.1 GB	8.7 GB



Definitions:

- File format is OK for preservation = Preferred, acceptable or tolerable formats per LAC policy.
- Transitory files = System generated files; application/software files; temporary files; 0 byte files etc. Ineligible for preservation per LAC policy
- Files with unknown policy = Non-standard file formats not accounted for in LAC preservation policy. Analysis required to determine LAC policy.
- Files unidentified = Cannot identify file format. Requires file-level assessment to determine preservation eligibility

Notes:

Data Assessment Report | LDFR Report | Content Categories Report | List Data

LDFR tool → LDFR Report

Files OK for preservation = Preferred, acceptable or tolerable file formats per LAC policy
Transitory files for removal = System generated files. Ineligible for preservation per LAC policy
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Files unidentified = Cannot identify file format. Requires file-level assessment to determine preservation eligibility

DI Comments	LDFR_status	LDFR_FilePath	LDFR_FileName	LDFR_PU	LDFR_Forma
Content looks to be related to an application. Moved to Disposition\Non-IREV	X2-Has PUID - Missing in LDFR	X:\PRI\2020-XXXX_Richard\OBJ\Transit\ORG\039_flop	PRINT.TST	fmt/1717	Time Stamp
Content looks to be related to an application. Moved to Disposition\Non-IREV	Z0-NO PUID Unknown File Format	X:\PRI\2020-XXXX_Richard\OBJ\Transit\ORG\039_flop	WINSTALL.COM		
Content looks to be related to an application. Moved to Disposition\Non-IREV	Z0-NO PUID Unknown File Format	X:\PRI\2020-XXXX_Richard\OBJ\Transit\ORG\039_flop	WINSTALL.OVR		
Content looks to be related to an application. Moved to Disposition\Non-IREV	Z0-NO PUID Unknown File Format	X:\PRI\2020-XXXX_Richard\OBJ\Transit\ORG\039_flop	WS.COM		
Content looks to be related to an application. Moved to Disposition\Non-IREV	Z0-NO PUID Unknown File Format	X:\PRI\2020-XXXX_Richard\OBJ\Transit\ORG\039_flop	WS.INS		
Content looks to be related to an application. Moved to Disposition\Non-IREV	Z0-NO PUID Unknown File Format	X:\PRI\2020-XXXX_Richard\OBJ\Transit\ORG\039_flop	WSBR.COM		
Content looks to be related to an application. Moved to Disposition\Non-IREV	Z0-NO PUID Unknown File Format	X:\PRI\2020-XXXX_Richard\OBJ\Transit\ORG\039_flop	WSMSGS.OVR		
Content looks to be related to an application. Moved to Disposition\Non-IREV	Z0-NO PUID Unknown File Format	X:\PRI\2020-XXXX_Richard\OBJ\Transit\ORG\039_flop	WSOVLY1.OVR		
	B1-ACCEPTABLE / Tested Automated Migration	X:\PRI\2020-XXXX_Richard\OBJ\Transit\ORG\41\!JD#3	!JD#3-10.896	x-fmt/394	WordPerfec
	B1-ACCEPTABLE / Tested Automated Migration	X:\PRI\2020-XXXX_Richard\OBJ\Transit\ORG\41\!JDDI	!JDDRAFT.3-J	x-fmt/394	WordPerfec
System/application file - moved to Disposition\Non-IREV	D4-Zero Bytes Files	X:\PRI\2020-XXXX_Richard\OBJ\Transit\ORG\41\DESK	DESKTOP		
System/application file - moved to Disposition\Non-IREV	X2-Has PUID - Missing in LDFR	X:\PRI\2020-XXXX_Richard\OBJ\Transit\ORG\41\FIND	FINDER.DAT	fmt/1730	Data File
System/application file - moved to Disposition\Non-IREV	Z0-NO PUID Unknown File Format	X:\PRI\2020-XXXX_Richard\OBJ\Transit\ORG\41\RESO	DESKTOP		

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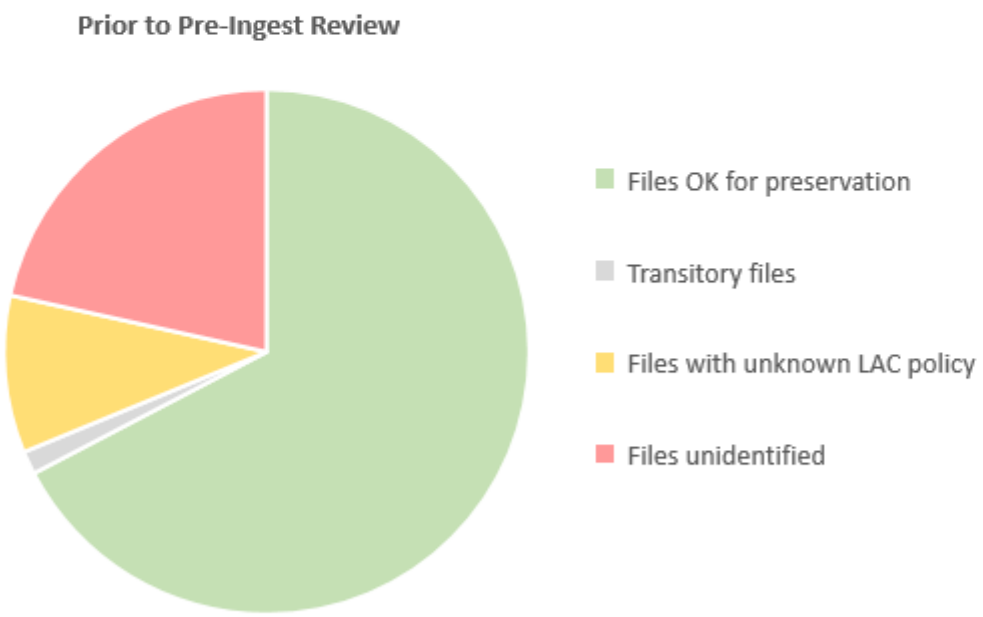

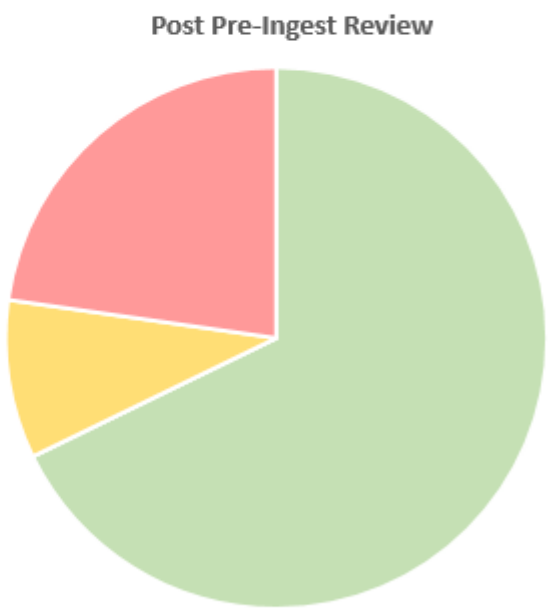

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Transform LDFR results into easy to understand Data Assessment Report

Can inform:

- Additional investment
- Management of resourcing
- Managing expectations re: access

TreeSize Report										
			Date:	2022-09-02			PRE-INGEST	POST PRE-INGEST		
Registration #:	2020-0132		Source:	PRI		Number of files:	235	184		
Pre-Ingest by:	Heather Tompkins		Donor/Department:	M. Richard		Number of folders:	37	30		
Archivist contact:	John Smith		Pre-Ingest server:	\\s42cvma06\FS03-Projects_PreIng\PRI\2020-		Total size:	9.2 MB	7.9 MB		
Category	**Result**	**# of files**	**Total size**	**Unit**		**Action Req'd**	**Notes**			**Reference** (i.e. hyperlink to spreadsheet)
Audio files	Yes	64	1.1	MB						
Video files	No									
Container files	No									
Duplicates	Yes	12	956.9	KB		Yes	TreeSize can be use to ID duplicate files. Archivist to determine what to retain.			
Websites	Yes	2	115.1	KB		No	HTM files - should be accessible via a web browser			
Email	Yes	1	207	KB		Yes	Possibly 1 eudora email file (maybe a mailbox?) on carrier 9. If archivist wishes to review/access, contact DI for further work.			\\s42cvma06\FS03-Projects_PreIng\PRI\2020-XXXX_Richard\OBJ\Transit\ORG\009
Data	No									
Databases	No									
Password protected files	No									
Encrypted files	No									
0 byte files	Yes	1				No	In Carrier 41 - weeded			\\s42cvma06\FS03-Projects_PreIng\PRI\2020-XXXX_Richard\OBJ\Disposition\Non-IREV\System-App-Files
Empty folders	No									
Long filepaths	No									
Non-IREV										
Deleted files - folder level weeding ($RECYCLE.BIN; .Trashes; TrueDelete)										
MAC OS - folder level weeding (.fseventsd; .Spotlight-V100)										
Temporary files	No									
System/Application files	Yes	50	0.98	MB		No	Files weeded to Disposition\Non-IREV			\\s42cvma06\FS03-Projects_PreIng\PRI\2020-XXXX_Richard\OBJ\Disposition\Non-IREV\System-App-Files
Configuration files	No									
Software development files	No									
Thumbs.db	No									
Virus/malware/spyware	No									

Communicating Pre-Ingest Results

- Documentation generated
  - Digital Object Inventory
  - Updated Physical Carrier Inventory
  - Duplicate Listing
  - Pre-Ingest Report
- Email or in-person meeting
- Archival processing commences

Thanks to **Maxime Champagne** (Team Lead, Digital Preservation section) for the development of the LDFR tool!

Further reading on the LDFR tool:

Smyth, Tom. 2022 *Do we really know our data? Assessing file format policy compliance and digital preservation tenability via a new software tool*. IPRES 2022 Conference Proceedings.

Contact info:

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