West Virginia GIS Technical Center
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January 3, 2025

TO: **WV Department of Transportation**
Information Technology Division
1900 Kanawha Blvd East
Building 5, Room A-720
Charleston, WV 25305

PROJECT: **WVDOH Collection of Historical ROW Data Phase 3 - State# T699-PHASE-3.00**

TIME PERIOD: December 2024

Progress Overview: As of January 3rd, 2025, all the August 2024 plans have been named and the scanning and processing tasks are ongoing.

Table 1. Scanning Progress for the **August 2024** Shipment

Description	#	Remarks
Plans Named/Entered into Database	190	Each plan set is named and uploaded into an Access database. **This is the total number of plans.**
Plan Sets Scanned	145	Each plan set sheet is scanned on a large-format scanner and stored as a TIFF file.
Plan Sets Image Processed	137	Each scanned sheet is processed in Adobe Photoshop by cropping and creating a clearer image.
Plan Sets PDF's Built	135	Each process sheet is compiled into one PDF Book using Adobe Acrobat software.
Plan Sets Georeferenced	114	Each plan set has a location map that is georeferenced for GIS reference.
Plan Sets QC'd/Renamed	98	Each plan set is QC'd to ensure there are no missing pages, artifacts, cropping issues, etc. Each plan set is then renamed for publishing.
Plan Sets Published	98	Each plan set is published to the map viewer after it has been QC'd and renamed. Web site records are QC'd to ensure published correctly.

Progress Overview: As of January 3rd, 2025, all the October 2024 plans have been named and the scanning and processing tasks are ongoing.

Table 1. Scanning Progress for the **October 2024** Shipment

Description	#	Remarks
Plans Named/Entered into Database	120	Each plan set is named and uploaded into an Access database. **This is the total number of plans.**
Plan Sets Scanned	16	Each plan set sheet is scanned on a large-format scanner and stored as a TIFF file.
Plan Sets Image Processed	16	Each scanned sheet is processed in Adobe Photoshop by cropping and creating a clearer image.
Plan Sets PDF's Built	16	Each process sheet is compiled into one PDF Book using Adobe Acrobat software.
Plan Sets Georeferenced	2	Each plan set has a location map that is georeferenced for GIS reference.
Plan Sets QC'd/Renamed	0	Each plan set is QC'd to ensure there are no missing pages, artifacts, cropping issues, etc. Each plan set is then renamed for publishing.
Plan Sets Published	0	Each plan set is published to the map viewer after it has been QC'd and renamed. Web site records are QC'd to ensure published correctly.

Project Overview: For all project phases, more than 437,000 sheets total have been scanned and 11,513 plan sets published. Specifically, for the Phase III project, ~162,000 sheets have been scanned and 4,661 plans published.

Table 2. Overall Project Overview. Plan Sets Published to Online DOT plans Application.

Description	#	Remarks
Sheets Scanned	437,777	Phase 1 (50,000), Phase 2 (225,000), and Phase 3 (~225,000) deliverables sum to 500,000 sheets.
Plan Sets Scanned	11,599	This includes plans that have not been processed.
Plan Sets Published to Viewer	11,513	Plans published to online application. https://www.mapwv.gov/DOTplans/
Average Sheets per Plan Set	37.9	
Full-time staff on project	2	
Temporary staff on project	8	
Scanners	2	
Image Processing Computers	9	
Total Storage Size of Files	12.3 TB	Total size of the back-up drive of 9/3/2024

Table 3. Scanning Breakdown by Plan Type

Plan Type Breakdown of Scans	#
ROW Plans	3,427
Bridge Plans	1,787
Construction Design Plans	5,994
Shop Drawings	23
Half-Sized Plans	497
As Built	20

Task 1: Finish scanning all Archival Highway Plans located at the Headquarters' Warehouse

- Scanning Phase I and Phase II projects completed 275,000 scanned sheets and published 6,852 plans in 2021.
- As of October 31st, 2024, more than 435,000 sheets total have been scanned and 11,448 plan sets published. Specifically, for the Phase III project, ~160,000 sheets have been scanned and 4,542 plan sheets published.

Task 2: Migrate WV Highway Plans Locator system to WV Division of Highways

- A meeting occurred on January 10, 2024, with key WV DOT personnel about the system migration. Key WVU contacts for the migration are Jim Schindling (enterprise databases), Yibing Han (GIS programmer), Eric Hopkins and Annaka Exley (scanning project operational leaders). Refer to the system migration meeting recording and documents. https://data.wvgis.wvu.edu/pub/project/scanning/SystemMigration/
- The last meeting concerning system migration was held Tuesday, October 31, 2023, at 2:00pm. Key information regarding the system migration is listed below.
  - The storage size information only details the main folder for data storage and hosting and does not include back-ups. Due to size constraints, batches of uncompressed individual .tif files are removed when storage is full as they are not necessary for publishing.
  - WVGISTC server specifications have been added for convenience.
- There are three major file groups: Uncompressed TIFFs, GeoTIFF (compressed and uncompressed), and PDFs (compressed and uncompressed). Files are compressed for storage and exchange purposes, and extracted for online applications where files require hosting on local servers. Total backup storage of all file groups is 11.2TB; however, much less online storage is required for the actual operations of the online plan retrieval system or www.mapwv.gov/DOTplans application.
- Software and system specifications are listed below:

Migration Tables:

Table 4. Storage used by File Type (As of 9/3/2024; Total **5.9 TB**; **Does not include back-ups**.)

File Type	Total File Size	% of Storage	Comments
GeoTIFF .zip Files	0.220 TB	3.1%	**Needed** for publishing to website.
Extracted GeoTIFF Files	0.622 TB	8.8%	**Needed** for publishing to website.
Compressed PDFs	0.684 TB	9.7%	**Needed** for publishing to website.
Uncompressed TIFFs	5.9 TB	86.1%	**Not** needed for publishing to website.

Table 5. Software Specifications

Software	Including	Use
MS SQL Server 2019 or Higher	PHP and MS Reporting Services (comes with MS SQL Server).	Relational database for storing project data and powering the DOT PlanViewer website; PHP/Reporting Services for maintaining the website software.
MS Access		Current graphical interface for interacting with MS SQL Database.
Windows Server OS		Underlying operating system for project servers.
MS Visual Studio 2022		Development software for updating and publishing Reporting Services reports.

Table 6. Server Specifications

Server	CPU Cores	Processor	RAM	Storage
Database Server	8	Intel® Xeon® Gold 5317 Processor 3.00 GHz	68.0 GB	500GB (NTFS)
ArcGIS Server	8	Intel® Xeon® Gold 5317 Processor 3.00 GHz	31.6 GB	200GB (NTFS)
File Server	2	Intel® Xeon® Gold 5317 Processor 3.00 GHz	8.00 GB	7TB (NTFS)
Web Server	3	Intel® Xeon® Gold 5317 Processor 3.00 GHz	10.7 GB	256GB (NTFS)

Task 3: Expand Functionality of Highway Plan Locator System

- Nothing to report.

Task 4: Project Management, Outreach, and System Administration Services

- Provided management and system administrative services. Refer to system and procedural documents: https://data.wvgis.wvu.edu/pub/project/scanning/Procedures/

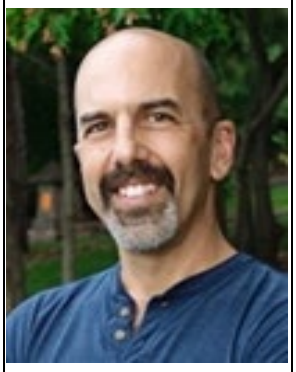
Project Notes:

- As of 12/3/2024 we are currently in the process of hiring new scanning interns. We have hired 3 interns so far this semester.
- More effort has been required for organizing, naming, and scanning the rolled-up plans delivered in the October shipment. The lack of transmittal sheets and folder have delayed the naming process. An estimate of how may more rolled-up plans we will be receiving would be helpful.
- Heather Maxey presented at the DOT GIS Day on 11/20/24.
- As requested by Kurt Donaldson, Dustin Feazell confirmed that scans newer than 2013 should not be scanned.

Project Estimations (As of 10/31/24) of Remaining Plans to be scanned:

- DOT Plan Drawers not Scanned: The estimated number of drawers remaining as of 9/3/24 are 145 drawers, according to estimations from Hunter Baldwin. There is another room of plans that WV DOT is currently looking into that might have plans which require scanning.
- Remaining Plans/Sheets. Assuming 5 plans per drawer, for 145 drawers there are an estimated **725 plans** to be scanned. Using an average page count of 37.8 sheets per plan, it is estimated there are **27,405 sheets** remaining to scan. Large outliers of plan sizes may skew the estimates.
- Project Time Remaining: Since October of 2023, 643 plans have been scanned. Based on the estimations of how many plans per drawer and the unknown rolled-up plans, a 30 July 2025 completion date does not seem likely and thus a no-cost extension will be requested.

WVGISTC DOT SCANNING PROJECT STAFF:

			
Annaka Exley *Project Lead* Graduate	**Jim Schindling** *Database and Programming* Consultant	**Heather Maxey** *Geography* Graduate	**Jack Copenhaver** *Cybersecurity* Junior
			
Elyssa Allen *Civil and Environmental Engineering* Graduate	**Darren Aguilera** *Geology* Senior	**Evan Cowgill** *Enviromental Science* Sophmore	**Christian Safford** *Earth and Enviromental Science* Sophmore
			
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Please contact me or the project leaders if you have any questions.

Sincerely,

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