TEIF/TEAL HMGP PROJECT: DATA DEVELOPMENT REPORT

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STATEWIDE DATA CONTRACTS

- **State GIS Contracts:** Two state contracts through West Virginia University were established for aerial imagery, parcel, and addressing data development projects to fill GIS data gaps that were preventing West Virginia from achieving detailed hazard identification and quality risk assessments. Data development focused on setting up and executing statewide contracts for developing the following GIS reference layers: aerial imagery, parcels, and addresses. New QL2 LiDAR was purchased and provided by FEMA Region III.

- **Total Projects:** For West Virginia communities, a total of 45 distinctive data development projects were completed for improving leaf-off aerial imagery (30 unique counties; 41 total counties), parcels (7 counties), and E-911 addresses (8 communities). Multiple counties took advantage of the aerial imagery contract by paying for imagery for more than one year, and thus increasing the total data development projects to 56.

- **Total Cost:** The total cost of the data development projects was $1,406,528, with the FEMA obligated dollars $542,541 and the remaining county cost share 61% or $863,987.

- **MOU Agreement:** A Memorandum of Understanding (MOU) was prepared and signed by each community. A total of 56 MOU's were created for all the projects that spanned the performance period of the grant. The MOU detailed the data deliverables, specifications, costs, cost-share, responsibilities, timeline, and signatures of all the partners (GIS Vendor, WV GIS Technical Center, and Community).

- **Data Development Documentation:**
  - TEIF/TEAL Data Development Resources Directory Folder
  - WV Flood Tool's Reference Layers PDF | PPTX

AERIAL IMAGERY

Business Case: Current and high-resolution aerial imagery is required for identifying at-risk structures and for developing foundation framework layers to include E-911 addressable structures and parcels. Aerial imagery is used throughout West Virginia to meet daily business needs. Imagery has many uses, including providing a common operating picture and accurately mapping the locations of natural and man-made features.

Completed Projects: 30 unique counties tapped into the contract and multiple counties took advantage of the contract more than once for a total of 41 county aerial imagery contracts (18,987 square miles).

Cost Share: The total cost share by counties was 85% ($713K) while the grant share was $124K. The entire aerial imagery cost with no county cost share contributions only had to be paid for two disadvantaged counties (Clay and Pendleton counties).

Milestone Accomplished: Replaced the legacy WV Sheriffs Association (2010-12) as the best available leaf-off imagery

Aerial Imagery Contract: In February 2019, a 4-year statewide contract (2019-22) through WVU Procurement was executed to provide bulk discounts for government agencies acquiring aerial imagery in West Virginia. Thrasher Group was awarded the contract.

Flying Season: The spring flying season was from late February to mid-April during leaf-out and no snow conditions.

Spatial Resolution: All counties were collected at 4-inch resolution except for Cabell (3"), Pendleton (6'"), and Randolph (6") counties.

Flyover Coverage: A total of 18,987 square miles were flown from this state contract.

Unit Costs: Aerial imagery could be purchased at four different pixel resolutions and over multiple budget cycles. Counties with limited funding qualified for grant cost-share. A fixed unit price by resolution per square mile was negotiated with the vendor in which most counties chose 4-inch resolution at $45 per square mile, with some exceptions in which counties chose either 6-inch ($36 per square mile) or 3-inch ($62 per square mile).

Non-Exclusive Contract: County offices still had the option to contract with other companies for the same services.

Public Domain: All county imagery data sets acquired via the contract reside in the public domain.

Resources:

- WV State Aerial Imagery Contract
- Aerial Imagery Program and Price Information
- MOU Template
- County Aerial Imagery Year Acquired
- County Aerial Imagery Resolution
- County Aerial Imagery Vendor
- Resolution Comparison – Baseball Fence
- Resolution Comparison – WVU Coliseum
- Statewide Leaf-Off imagery web map service
- Download County Aerial Imagery

DIGITAL PARCELS

Business Case: Accurate, current property parcels and assessment attributes are essential to identifying structures in at-risk hazard zones.

Completed Projects: Seven counties received grant funds of $321K with a 22% county cost share to convert paper to digital tax maps. A total of 136,364 parcels were mapped.

Milestone Accomplished: In 2004, only five counties had GIS parcels. This grant provided funding to convert all remaining paper tax maps to digital so now all 55 counties maintain and publish tax maps in an electronic format.

Parcel Contract: The GIS professional services company Atlas Geographic Data Inc. was awarded the parcel contract to convert all remainder paper tax maps to digital. For enhanced spatial accuracy, the parcel conversion projects involved imaging all existing tax maps and plats on file, and then using these legal sources combined with other source data (tax maps, assessment acreage, visible occupation lines, road widths, imagery, etc.) to construct the tax parcel geometry while linked to the correct assessment record.

Parcel Error Tracking: Parcel errors tracked for the floodplain building inventory include errors in geometry (unmapped parcels, misaligned parcels) and tax assessment attribute issues (missing assessment records, assessment record not linked to parcel geometry where assessed structure is located on map).

- **Parcel Geometry Misalignment or Parcel Shifts**: Re-mapping of counties where parcel geometry is misaligned, and the building footprints are in the wrong parcel. Although the tax parcels are not mapped to survey grade specifications and primarily for tax assessment purposes, property owners do expect their building footprints to be in the correct assessment parcel. To correct tax maps that have major misalignment errors, it often requires Coordinate Geometry (COGO) mapping of the deeds and plats to reference the parcel geometry correctly to the real-world surface.
- **Reconciliation of Parcel Geometry and Assessment Records:** Assessors should routinely reconcile the parcel geometry with the assessment records and correct any linkage errors between the parcel geometry and assessment records. Review the IAS-GIS mismatch spreadsheet to review errors between assessment records and parcel geometry.
- **Correlation of Assessment Record to more precise Parcel Geometry:** For multiple adjoining or split parcels owned by the same individual(s), assessment records should correlate to the parcel geometry where the primary structure is located -- not vacant neighboring parcels where no buildings exist. GIS applications that inventory building locations must set up a secondary parcel identifier if the assessment record does not correlate to the location of the building footprint.
- **Physical Addresses should correspond to E-911 Addresses.** E-911 addresses are the authoritative addresses and utilized by the county assessor offices.

Parcel Workflows: Parcels are maintained at the county level and integrated into a statewide data layer by the WV Property Tax Division.

ADDRESSES

Business Case: Accurate, current E-911 addresses are essential to identifying structures in at-risk hazard zones. E-911 addresses are the authoritative address of structures and are an essential spatial identifier. Besides address required for E-911 emergency management purposes, complete and correct addresses are important for multiple state agencies involving a wide range of applications, to include COVID Tracking (DHHR), Voter Registration and Redistricting (County Clerks/Secretary of State Office), Statewide Building Level Risk Assessment (WV EMD), Transportation Road Network/Planning (WV DOT), etc.

Completed Projects: Addresses for flood-prone communities such as Marlinton (Pocahontas County), Mullens (Wyoming County), and Rowlesburg (Preston County) were updated. In addition, the community of Rowlesburg was re-addressed. Addressing deficiencies for the counties of Clay, Fayette, Hardy, Morgan, and Pocahontas counties were updated as well. A total of 56,818 addresses were mapped.

Milestones Accomplished: This project resulted in Morgan County, which had major gaps in its E-911 address mapping, to receive a complete GIS addressing and mapping database. It also provided funding to correct addressing deficiencies for communities devastated by floods in the past.

Addressing Contract: The GIS professional services company Atlas Geographic Data Inc. was awarded the addressing contract to correct addressing deficiencies (missing/incorrect addresses, spatial location) of flood-prone communities in the State. The data was formatted according to NENA standards and submitted for inclusion in the Statewide Addressing and Mapping System (SAMS).

Addressing Error Tracking. Addressing errors tracked for the building inventory included missing and incorrect addresses.

Address Workflows:

- Acquisition. E-911 addresses are maintained at the local and county jurisdictional levels.
- Monitoring. Monitoring and submission of addresses to the State is performed by the WV EMD.
- Integration. The WV EMD provides technical support and integration of local addresses into the Statewide Addressing and Mapping System (SAMS).
- Publishing. The WV GIS Technical Center provides Locator web services for publishing the addresses for the public.

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Table 1. Data Development Statistics for TEIF-TEAL HMGP Project

GIS Data Development Contracts	Time Period	Obligated	Unit Price	Data Products	# Projects	Vendor	FEMA Grant Dollars Obligated	Local Govt. Cost Share ($)	In Kind Cost Share (aerial imagery or field verification)	TOTAL COST	County Cost Share
E-911 Addresses	2019-2021	$125,000	$2.20 per address (variable depending on scope)	56,818 addresses mapped	8	Atlas Geographic Data	$96,220	$22,300	$40,080	$158,600	39%
Digital Tax Maps/Parcels	2019-2021	$375,000	$2.48 full tax map parcel $1.50 remapped parcel	136,364 parcels mapped	7	Atlas Geographic Data	$321,843	$15,330	$73,418	$410,591	22%
Leaf-Off Imagery	2019-2022	$125,000	4" ($45 sq. mi.)	41 county projects, 30 unique counties	41	Blue Mountain / Thrasher Group	$124,478	$712,859		$837,337	85%
TOTAL		$625,000			56		$542,541	$750,489	$113,498	$1,406,528	61%