



Presented at the FIG Working Week 2023,  
28 May - 1 June 2023 in Orlando, Florida, USA

# FIG WORKING WEEK 2023

28 May - 1 June 2023 Orlando Florida USA

Protecting  
Our World,  
Conquering  
New Frontiers

## Creating a digital future

### Monrovia: From 1995 Block Mapping Survey to 2023 Digital Cadastre

Christopher Byren, Lantmäteriet, Sweden

Dr. Mahmoud Solomon, Liberia Land Authority, Liberia

Frank Pichel, PLACE, USA



Organized By



Diamond Sponsors



It started with the  
discovery of an old  
atlas

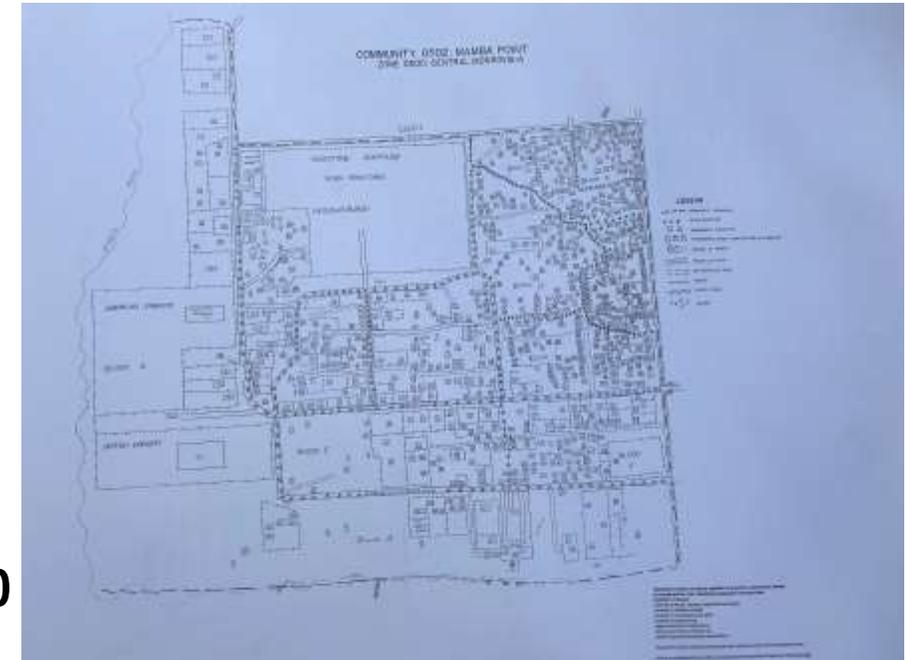


## Hand-sketched block mapping of Monrovia

- Produced by the World Food Programme and UNFPA between 1994-1997, during a lull in the Liberian civil war.
- The block mapping of the atlas is 3D, given that apartments have also been captured.
- Two directories were also discovered that list the principal occupants that either own/owned or inhabited the properties at the time of mapping.
- Since Liberia more or less lacks spatial information, and hardcopy maps, cadastral and otherwise, the find of the atlas is remarkable.

## From hardcopy to digital

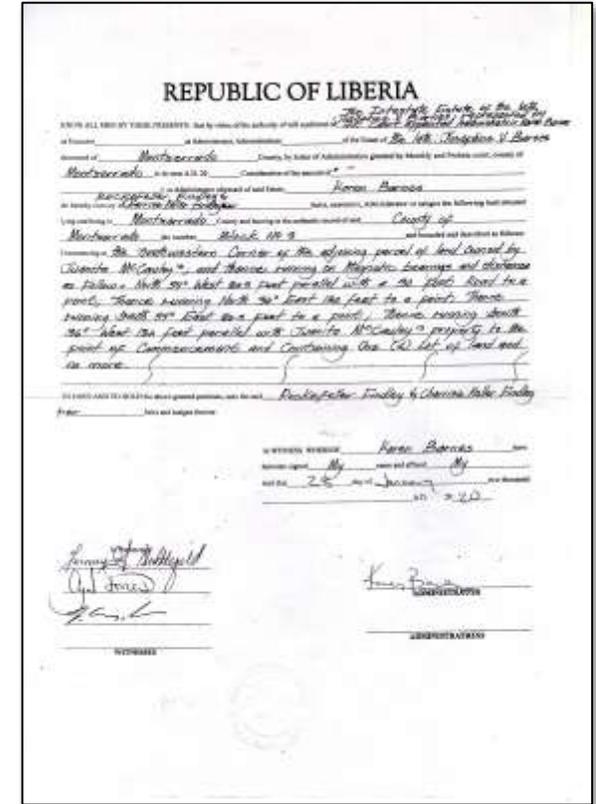
- The scanning of the Atlas and directories was done at the National Archives (Riksarkivet) in Sweden.
- Digitization of the Atlas is on-going, and OCR will be used to link the information from the directories to the properties as attribute data.
- The goal is the creation of a digital cadastral map of Monrovia, anno 1997.



## Next step - linking database records to title deed images

- In parallel to the digitization of the Atlas work is ongoing to resurrect the now obsolete Open Title digital title deed solution.
- Cross-reference the database with title deed records against the attribute data on the properties/land parcels.
- Possibility to link title deeds to properties, if the occupant of the property at the time was also the owner.

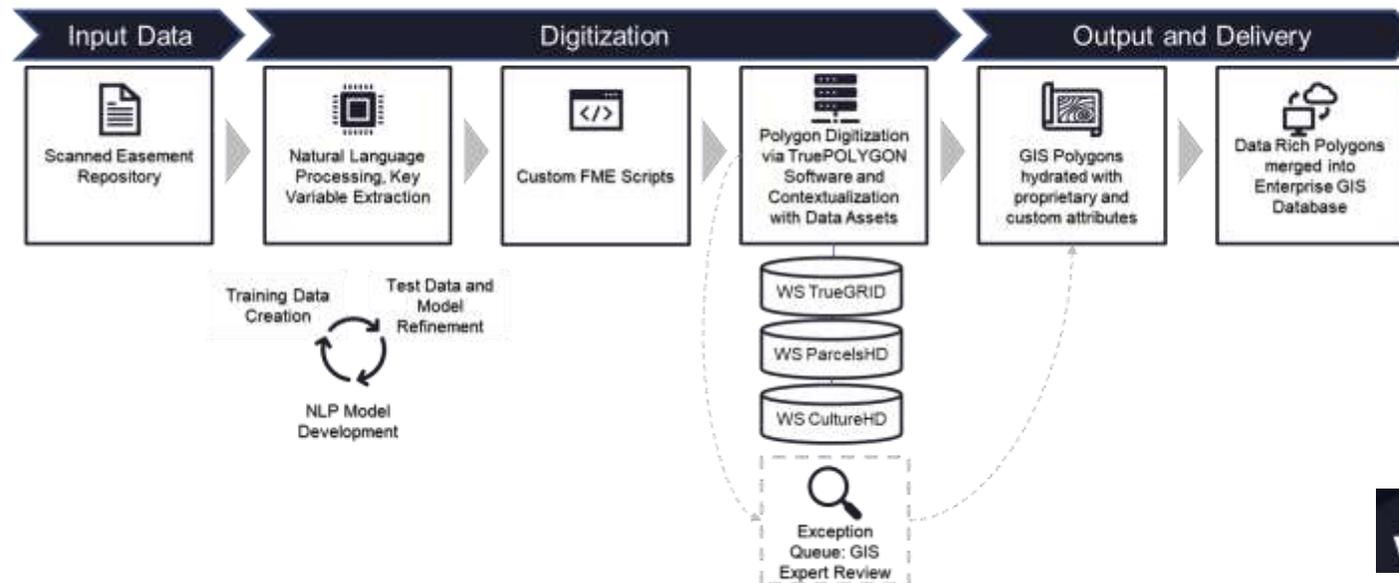
From paper to polys -  
AI and machine  
learning



## Potential workflow

### Land Digitization Solution

How it works



# FIG WORKING WEEK 2023

28 May - 1 June 2023 Orlando Florida USA

*Protecting Our World, Conquering New Frontiers*

Solution **Digitization**

Computer Vision AI



## **Transfer Deed #1 Beryan Mulbah & Bodoe Mulbah**

Commencing at the North western Corner of the adjoining parcel of land bearing initials marked D.M. and thence running on magnetic bearings as follows- South 29 East, 132 feet to a point; thence running South 61 West, 82.5 Feet to a point, thence running North 29 West, 132 feet to a point; thence running North 61 East, 82.5 feet parallel with a 20-foot street to a point of Commencement. And containing One (1) Lot: acres of land and no more.

Commencing at the North western Corner of the adjoining parcel of land bearing initials marked D.M. and thence running on magnetic bearings as follows- **South 29° 00' 00"** **East 132 feet** to a point; thence running **South 61° 00' 00"** **West 82.5 Feet** to a point, thence running **North 29° 00' 00"** **West 132 feet** to a point; thence running **North 61° 00' 00"** **East 82.5 feet** parallel with a 20-foot street to a point of Commencement. And containing One (1) Lot: acres of land and no more.

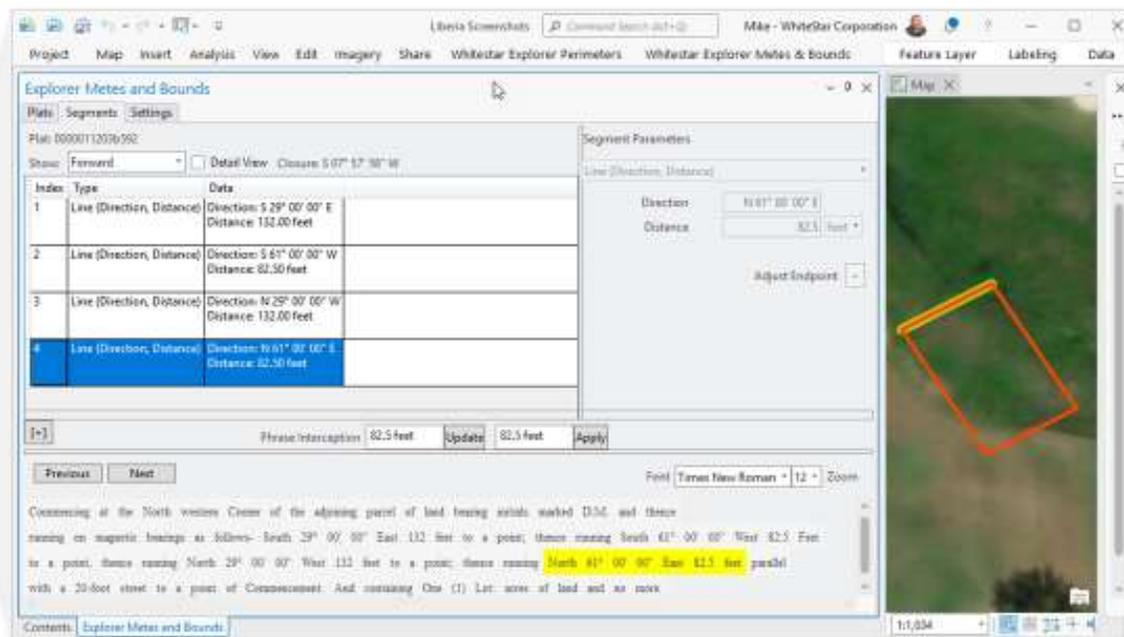


Solution **Digitization**

### Automapper Ingest

#### Transfer Deed #1 Beryan Mulbah & Bodoe Mulbah

Commencing at the North western Corner of the adjoining parcel of land bearing initials marked D.M. and thence running on magnetic bearings as follows- **South 29° 00' 00" East 132 feet** to a point; thence running **South 61° 00' 00" West 82.5 Feet** to a point, thence running **North 29° 00' 00" West 132 feet** to a point; thence running **North 61° 00' 00" East 82.5 feet** parallel with a 20-foot street to a point of Commencement. And containing One (1) Lot: acres of land and no more.



Index	Type	Data
1	Line (Direction, Distance)	Direction: S 29° 00' 00" E Distance: 132.00 feet
2	Line (Direction, Distance)	Direction: S 61° 00' 00" W Distance: 82.50 feet
3	Line (Direction, Distance)	Direction: N 29° 00' 00" W Distance: 132.00 feet
4	Line (Direction, Distance)	Direction: N 61° 00' 00" E Distance: 82.50 feet

Segment Parameters:  
Line (Direction, Distance)  
Direction: N 61° 00' 00" E  
Distance: 82.5 feet  
Adjust Endpoint

Previous Next

Point: Tamas New Roman \* 12 \* Zoom

Commencing at the North western Corner of the adjoining parcel of land bearing initials marked D.M. and thence running on magnetic bearings as follows- South 29° 00' 00" East 132 feet to a point; thence running South 61° 00' 00" West 82.5 Feet to a point, thence running North 29° 00' 00" West 132 feet to a point; thence running **North 61° 00' 00" East 82.5 feet** parallel with a 20-foot street to a point of Commencement. And containing One (1) Lot: acres of land and no more.



Can AI solve the puzzle of georeferencing title deeds?

