



June 2, 2020

Mr. Mike Edwards  
GIS Manager  
Department of Public Utilities  
City of Columbus  
910 Dublin Road, 3<sup>rd</sup> Floor  
Columbus, Ohio 43215

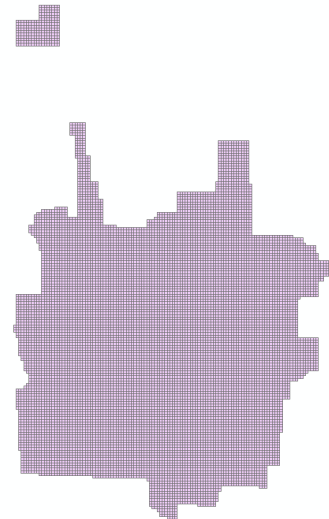
**RE: 2021 City of Columbus Orthoimagery Program**

Dear Mr. Edwards:

Woolpert is pleased to submit our scope and fee proposal for the 2021 City of Columbus Orthoimagery Program.

### Project Boundary

The image to the right depicts the 2021 City of Columbus Project Area, which also includes the Upground Reservoir located in northwestern Delaware County. The 2021 Project Area includes all of Franklin County and portions of Delaware, Union, Licking, Fairfield, Pickaway and Madison Counties. In total, the Project Area is comprised of approximately 680 square miles (614 square miles – City of Columbus Service Area; 53 square miles – Reservoir Priority Areas; 13 square miles – contiguous tiles to “square up” the Project Area).



### Project Services

#### Aerial Imagery Acquisition

Woolpert will acquire new 3.0-inch, 4-band, 8-bit aerial imagery covering the Columbus Project Area. Aerial imagery will be acquired during the months of March-April 2021 (during “leaf-off” conditions and during the absence of snow/cloud cover and when rivers and streams are within their normal banks, unless otherwise negotiated with the City) with an average sidelap of 60%. The aerial imagery will support the generation of project area wide 1”=50’ scale orthoimagery with a pixel resolution of 3.0-inches. The imagery will be acquired when the sun angle is 25-degrees or greater. Supplemental flight lines will be acquired over the Downtown Area bounded by SR 315 on the west, I-670 on the north, I-71 on the east, and I-70 on the south. Additional supplemental flight lines covering High Street from SR 104 north to I-270 near Worthington, and along 4<sup>th</sup> Street from I-



670 north to 5<sup>th</sup> Avenue will be acquired. These supplemental flight lines will be acquired when the sun angle is at or near the highest (solar noon) to minimize building shadows.

## Ground Control

Woolpert will utilize existing ground control established for the Columbus 2011, 2013, 2015, 2017, 2019 Ortho and 2012 Contour Projects to support 1"=50' scale ortho base mapping (3.0-inch imagery).

If any additional ground control is needed (i.e. due to an existing point being destroyed or obscured), Woolpert will perform the survey and supply a control diagram to the City of Columbus depicting the proposed location(s) of the new horizontal and vertical GPS control points. Each new control point (if necessary) will consist of a photo identifiable point (i.e. north edge of sidewalk at east edge of paved driveway).

## Mapping Standard

The mapping standard, datums, coordinate system and units to be used for the project are as follows:

### Ortho Mapping Accuracy Standard

American Society of Photogrammetry and Remote Sensing (ASPRS) Standards for Digital Geospatial Data (edition 1, version 1.0-November 2014) guidelines.

The 7.5cm (3-inch) orthoimagery will be produced by Woolpert to meet ASPRS Positional Accuracy Standards for Digital Geospatial Data (2014) for a 15cm RMSE<sub>x</sub> / RMSE<sub>y</sub> Horizontal Accuracy Class which equates to Positional Horizontal Accuracy = +/- 37cm (+/- 1.2ft) at a 95% confidence level.

**Note:** The above is equivalent to the 1990 ASPRS, Class 1 Accuracy Standard

### Datums

Horizontal: North American Datum 1983 (HARN)

Vertical: North American Vertical Datum 1988

### Coordinate System/Geoid/Units

Ohio State Plane, South Zone; Geoid12b; US Survey Feet

## Aerial Triangulation

Woolpert will perform aerial triangulation on the newly acquired aerial imagery acquired during the winter/spring of 2021. Triangulation extends and densifies the ground control and will subsequently support the 1"=50' scale ortho base mapping.

## Ortho Base Mapping

In 2021, Woolpert will produce project-wide (680 square miles) 1"=50' scale ortho-imagery, with a pixel resolution of 3.0-inches. The existing Columbus LiDAR DEM (2019) will be used to rectify the new 3.0-inch aerial imagery. The final ortho tiles will be delivered as 4-band (RGBN), 8-bit geoTIFF imagery. Utilizing the existing tiling system for 3.0-inch (1,250' x 1,250' tiles), the ortho tiles will be approximately 100 megabytes in size.



For the City’s review, the new ortho-imagery will be cached to Woolpert’s SmartView Connect Redline Server. Woolpert will provide user accounts and instructions on the use of the web server.

After the City has reviewed and accepted the orthoimagery, the imagery will be processed and delivered in geoTIFF format (with the appropriate TIFF World files and metadata) and MrSID Image Format (based upon the MrSIDs previously delivered as part of the 2019 ortho project).

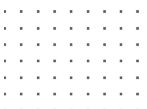
## Schedule

### Project Tasks

- Woolpert will acquire new aerial imagery on or before April 15, 2021.
- Woolpert will produce and cache the 3.0-inch ortho-imagery (for Columbus’ Review) to Woolpert’s SmartView Connect Server on or before July 31, 2021.
- Upon acceptance (by Columbus) of the base ortho-imagery, Woolpert will process the citywide MrSIDs (separate natural color and color infrared MrSIDs) and deliver all ortho data (MrSIDs and geoTIFFs) on an external hard drive. This process will require approximately 30 days from the date of acceptance by Columbus.

## Deliverables

- One set of 4-band, 8-bit color geoTIFF imagery, with corresponding World files (for each ortho tile)
- One set of MrSID Images (9 – 50x (natural color) and 9 – 50x (color infrared))
- All ortho data will be delivered on an external hard drive



## Fees

4-Band, 8-Bit Orthoimagery	
<i>Service</i>	<i>Fee</i>
2021 – Citywide 1"=50' Scale 3.0-Inch Orthoimagery (4-band, 8-bit)	<b>\$223,720</b>

Invoicing will be based upon project milestones (completion of imagery acquisition; processing of orthoimagery (placed on SmartView Connect); delivery of orthoimagery).

We appreciate the opportunity to present this price proposal and look forward to working with you and your team again.

Sincerely,

**Woolpert, Inc.**



Jeff Lovin, CP, PS  
Senior VP, Market Director