MILWAUKEE COUNTY LAND INFORMATION COUNCIL
June 2019 Council Meeting

AGENDA

Date: June 4th 2019
Time: 9:00 a.m.
Place: Milwaukee Metropolitan Sewerage District
MMSD, OJ Noer Conference Room
260 W Seeboth St.
Milwaukee, WI. 53204

I. Roll Call

II. Minutes from the Council meeting held December 5th, 2018

III. 2019 Land Information Office Budget Update

IV. 2019 LIO Workplan Project Updates

V. Reports\Activities
   1. 2018 County Surveyor Report
   2. 2018 Retained Fees & Grant Report
   3. 2020 LiDAR Capture
   4. 2020 Imagery Capture

VI. New Business

VII. Date, time, and place of next meeting

VIII. Adjournment
I. Roll Call
Chairman Bruhn called the meeting of the Land Information Council (LIC) to order. Roll call was taken by circulating the attendance sheet.

II. Minutes from the Council meeting held June 5th, 2018
Champagne noted one amendment to be made to the minutes from the June meeting of the LIC on June 5th, 2018. In the fourth paragraph under
section IV – 2018 LIO Workplan Project Updates, under Emergency Management – NG911, Christine Westrich replaced Nicole Grams in the WLIA taskforce, not the Governor’s subcommittee.Bruhn asked if there were any other corrections on the LIC meeting minutes from June 5th, 2018. None were suggested.

III. Announcement of ICC Rep to Land Information Council
Bruhn noted that he and Christine Westrich from the Office of Emergency Management (OEM) worked together to solicit a representative from the Intergovernmental Cooperation Council (ICC) to be a member of the LIC. Shorewood Village President Rozek has decided to become a member, but was unable to attend the meeting. Her membership will help represent other municipalities in Milwaukee County. Bruhn asked whether there were any questions about the addition of the new ICC representative to the LIC. None were raised.

IV. 2018 Land Information Office Budget
Bruhn highlighted current and projected revenues for 2018. Predicted revenue was $840,000 from the recording fees at the Register of Deeds. The actual number will likely come in around $805,000, which is $35,000 or 5% short. Miscellaneous revenue included work done for the North Shore Fire Department. Operating expenses remain consistent throughout the years, including a cross-charge of the Register of Deeds GIS Analyst position. There is a projected surplus for 2018 just under $50,000. Changes are reflected in the reserve account and show a total of 1.65-1.7 million.

Bruhn added that the county surveyor and imagery projects have been encumbered and paid, while the vertical datum project has not been paid out but has been encumbered. Bruhn asked if there were any questions on the 2018 LIO budget. None were raised.

V. 2019 Land Information Office Budget
Bruhn reviewed major changes for the 2019 budget. Bruhn stated that the cross-charge of the Register of Deeds GIS Analyst position has been changed into personal services. He notes that 15% of the budget towards the current healthcare and pension plans, while another 15% goes towards legacy costs. Bruhn has asked for some leeway from the LIO’s budget office, but has not yet received any. He has posed the question of what percentage in a budget is required before an abatement of cost is given. Unlike other departments, the Land Information Office (LIO) is 100% revenue-based.
Bruhn stated that in commodities, contract personal services were increased to reflect true cost of LTE employees and short-term projects. Champagne inquired why there was a lack of funding for membership dues on the projected 2019 budget. Bruhn explained that it was not by his request, but was overlooked on the performance side by the budgeting office. Bruhn noted that these memberships were for the WLIA and GITA only, and that these memberships are important to maintain. Membership will populate in budget, even if it is a negative amount.

Bruhn asked if there were any additional questions on the 2019 budget. Supervisor Haas inquired about the absence of postage and internet from the projected 2019 budget. Bruhn explained that while packets used to be mailed out, it is now more efficient to send them electronically. Postage is usually used when mailing hard drives. The only internet charge would be for the cloud space needed to store our data and should be a minimal cost. Bruhn asked if there were any further questions on the 2019 budget. None were raised.

VI. Land Information Council Charter and Bylaws

Bruhn drafted a charter and bylaws for the LIC as a task determined at the last LIC meeting. Upon searching for relevant historical documents to inform his drafts, none were found other than a reference to a charter in 1989. The documents include a background of the LIC, including how and why it was created, the statute that implements it, the members, the duties of its members, etc.

Bruhn clarified that some of the duties of LIC members include voting on drafted articles, advising or recommending bylines, and guiding the LIO based on the needs of others in Milwaukee County. Along with the bylaws, the officers and duties were drafted, including terms and vacancies. The Milwaukee Corporation Council reviewed the draft and provided definitions for the LIC. It was written that agencies can appoint their own members. Formal member appointments through the County Board are not required.

Bruhn noted that agendas will be available five full days before meetings and other materials one week in advance, though he will strive to do so two weeks in advance. Minutes from LIC meetings will be distributed within ten business days of the meeting. Bruhn opened the proposal to questions, comments, or revisions. None were raised. Bruhn requested a motion to accept the updated charter and bylaws. The motion was made by Ms. Olson and seconded by Ms. Champagne, and approved unanimously.
VII. 2018 LIO Workplan Project Updates

Bruhn followed-up on the project updates discussed at the previous LIC meeting on June 5th, 2018.

1. Website
   Bruhn noted that the new frontend website through Titan is complete and fully functional.

2. Migration to the Cloud
   Bruhn explained that Milwaukee County now has a cloud-based infrastructure. To address potential hardware needs, the LIO had set $40,000 aside, but no cost came to the LIO. Since the migration, the LIO’s bandwidth and ability to process throughout and redundancies has grown exponentially. The department has since been able to take on greater throughput and data, as well as plan for disaster recovery.

3. Cityworks
   Bruhn mentioned that an update on this will be given at a later time.

4. NextGen911
   Bruhn stated that at the June 2018 meeting, this project was noted as 10% complete. This has been moved back to 0%. As communication improves and budget requests are made, there will be a better idea of the major requirements that may take place in this changing system. The State just moved forward with a two-year plan to pursue NextGen911. At this time, exact scope and requirements of the project are uncertain.

   Olson inquired as to whether the project has an anticipated end date. Champagne responded that seminars have estimated the entire project, not just the GIS aspect, to take ten years to complete, though that is only speculation until more information about the project requirements are known.

   Olson also inquired whether progress on that project will take place in 2019. Bruhn explained that once the project requirements are better understood, there will be progression on the project. There are currently zero data requirements from the State, all that is known is that $6.4-6.9 million has been dedicated to creating the infrastructure for NextGen911. An educated stipulation about the state parcel initiative would place Milwaukee County in a better place to
implement the program than other counties with fewer resources and the grant could go to support their efforts, though the change is still in the very early stages. Bruhn noted that Minnesota is more than five years into the program and still working on it.

Olson asked whether NextGen911 is being combined with Esinet. Champagne stated yes, and Swingen elaborated that he believes Esinet is the hardware and infrastructure used to implement programs like NextGen911. Olson raised a point of clarification about whether NextGen911 can be implemented without Esinet. Swingen explained that the State will likely implement a grant to encourage municipalities to use a single statewide Esinet instead of individual programs for municipalities or counties. Olson asked whether similar programs besides NextGen911 are available, and Swingen confirmed that while other 911 text options might be available, NextGen911 offers the ability to receive and distribute photos and videos as well. Bruhn followed-up that it is important to ensure that the dispatch is correct. Unknown portions of the GIS requirements will be discussed at future seminars. Many different levels of government will discuss this program, so it is important to maintain communication.

5. Cadastral Improvements
   Bruhn mentioned that this will be discussed in a report.

6. LUCA
   Bruhn said that this has been successfully submitted by Milwaukee County and most municipalities, but they have yet to hear back. The statistical analysis will be for the revision of census boundaries. The topic was mentioned at the user group meeting on November 8th, 2018 and then raised at a subsequent meeting with the other municipalities. The City of Milwaukee participates in this, but Milwaukee County does not. Olson noted that she had not heard anything about this prior except a request.

7. Unified Zoning Layer
   Bruhn mentioned that a continued goal for 2019 is to have a unified zoning among the municipalities that can be aggregated together and presented.

8. Non-Map
Bruhn mentioned that this project would include having a text look-up apart from the spatial aspect.

9. Data Transformation
Bruhn mentioned that this will be discussed in a report with the vectors.

10. Vertical Datum Transformation
Bruhn said that this project is currently underway and is listed as 75% complete. Its estimated completion is in the beginning of 2019. Bruhn will report on the status of this at the next LIC meeting in June 2019.
Merry noted that the target date to complete the development for a regionwide transformation to NAD 83 is at the end of February.
Bruhn noted that the completion of this will also be the completion of the vertical and horizontal data transformation for the seven counties of SEWRPC from NAD 27 to NAD 83.

11. Orthophoto
Bruhn mentioned that this will be discussed in a report.

12. Sanborn (1894)
Bruhn noted that the Sanborn collection needs to be briefly taken down so that a few small errors can be fixed before it is republished.

13. Land Information Plan
Bruhn asked for questions on the 2018 plan. None were raised.

Bruhn noted that capital for enterprise asset management will conclude at the end of 2018. A GIS Analyst position has been created to support Facilities Management and is paid through Facilities Management. There are currently 107 layers in asset management or enterprise GIS. The collection is just shy of 250,000 assets at present throughout Milwaukee County. An estimated 60,000 service requests will be made each year, and about 10,000 requests have already come in. Senior management is now more aware of the program’s GIS basis. Bruhn referenced the snapshots in the distributed documentation.
Bruhn noted that Service sites, collector applications, 3-D views, and inventory management of internal spaces at County facilities are among the current asset management efforts underway at the LIO. Bruhn asked for questions on the topic. None were raised.

Cadastral Report
Bruhn explained that Phase I of the project is 37% complete and is ahead of schedule. The completion rate at the previous meeting in June of 2018 was 5%. This rate is anticipated to slow down once the project moves into more dense areas in and around downtown, and the anticipated completion date for the project is December of 2019.

Merry inquired as to whether this data was referenced to NAD 83. Bruhn confirmed that it is.

Olson inquired as to why the project was being worked on in different areas. Bach explained that four editors are now working on the project, and that the areas currently being worked on around the City’s periphery contain less complex data than the quarter sections closer to downtown.

Data Migration
Bruhn recounted that a user group meeting was held on November 8th, 2018 to announce and facilitate the transition of service from NAD 27 to NAD 83 for all Milwaukee County data users. December 31st, 2018 is the designated cutover date. After that date, Milwaukee County will no longer maintain data in NAD 27. It will still be available in archive folders for those who still have use for it.

Merry inquired whether the NAD 27 data will no longer be accessible to Milwaukee County data users. Bruhn clarified that NAD 27 data will be downloadable in Dropbox, but will not be available online. This is not a hard cutoff, but the goal is to encourage movement in the direction of NAD 83 before the next datum comes out in 2022. Bruhn asked for additional questions on the data migration. None were raised.

2018 Ortho and Oblique Capture
Bruhn said that the 2018 imagery has been published. Those services are available to view and download on the website. Going forward, reaching out to the largest consumers of this data for feedback should be a priority so their feedback and data needs can be addressed. The City of Milwaukee represents approximately two-thirds of the ortho and oblique imagery data usage. Their need for higher resolution imagery is already known. Meeting with the City of Milwaukee Assessor’s Office will help
oblique accounts be monitored and meet requirements for consumers, even if the interval between oblique updates increases.

Champagne asked, on a related note, whether new Lidar is also included in this imagery. Bruhn explained that it is part of the three-year plan that includes a 2020 flight for new images.

Champagne followed-up with an inquiry as to whether the new imagery would change in resolution. Bruhn confirmed that there will be a change in technology and that it will need to comply with the planning commission. The 2020 flight will not go down in resolution, but at present, details are unknown about whether or how the new technology improves image resolution.

Merry stated that, unlike Geiger, flights could capture 20 points per meter instead of the previous 8 and fly higher than in the past. Data is still unavailable from flights conducted in 2017. At present, it is still difficult to determine how new technology will perform in urban areas, as it was not designed with them in mind. Additionally, emerging technologies like those with dual Lidar scanners might be better than Geiger.

Champagne stated that more requests have come in for 3-D topographic services for use as contour lines, etc. Processing these requests requires greater focus on precision and accuracy. Bruhn agreed that the County, including the engineering department, has had increased requests for 3-D topographic services as well.

Champagne noted that this is especially important given the new rules being implemented that will institute a seven-year interval. Merry confirmed this. Bruhn stated that five-year intervals should be fast enough for current needs. Champagne noted that this is also important given recent changes amongst floodplains in many communities.

VIII. 2019 LIO Workplan

Bruhn mentioned the importance of keeping the planimetric data updated along with the imagery. A major investment was made to do this about a decade ago and it needs to be updated in order to remain useful.

Olson inquired as to whether the updates would be done in-house. Bruhn assured that he would prefer to do so, especially the change detection, but if current workloads do not permit it, a previously used third-party could be contacted to take it on. Olson offered a point of clarification for the Council that the City of Milwaukee went to RFP for building footprints in the past, and were later told by Pictometry that the imagery could not be used. An attorney from the company reached out to state that another vendor’s imagery could not be used either. This issue has yet to be fought. Merry inquired as to whether the limitations were put in
place for the Orthographic or Oblique imagery, as the Orthographic imagery is entirely public domain, while the Oblique imagery is proprietary. Olson noted that mention of the Oblique imagery may have been mistakenly included in the correspondence. Bruhn remarked that he has made Oblique imagery available for the public to download.

2020 Imagery and LIDAR
Bruhn mentioned that this is the same as mentioned previously, with 150 listed for imagery and 75 for the Lidar (corrected to 100). He noted that clarification must be made to identify where and who funding will come from.

Merry explained that it will come through planning programs and that money through the commission would be available, with $200,000 divided amongst the seven counties. This currently takes place every five years, but the commission is considering an increased interval to address Milwaukee County’s needs.

NG911
Olson asked whether the end date should be changed to say 2019. Bruhn said he will correct the date.

Cadastral Updates
Bruhn noted that Cadastral updates are expected to run through the end of 2019. The transition from Phase I to Phase II will address more complex issues and require the time and efforts of more senior staff. Each instance could take hours or days to research and correct.

Zoning
Bruhn explained that, as mentioned earlier, this has an expected end date of February 2019. An update will be given at the next LIC meeting in June of 2019. This information is also from the 2017 strategic initiative plan. Bruhn asked if there were any questions about zoning. None were raised.

Vertical Datum Change
Bruhn explained that this project has an anticipated end date of February 2019. A status update will be given at next meeting in June. This is also a carryover from the 2017 strategic initiative plan.
Bruhn asks if there are any questions with the 2019 LIO Workplan. None are raised.

IX. Reports/Activities

1. 2019 WLIP Grant Request

Bruhn noted that this will include the entire document from the State. $1,000 for attending WLIA and other regional conferences. $50,000 will be assigned to Lidar for 2020 and carryover. Lidar updates will be done first, in 2019, and imagery will be subsequently collected in 2020. Bruhn asked if there were any questions about the grant request. None were raised.

2. 2019-2021 Land Information Plan

Bruhn recounts that visions and feedback for the plan were requested at the June 2018 LIC meeting. All feedback has been included and is appreciated.

Haas noted that his last name is spelled incorrectly on page 49 of the distributed packet. Hollers noted that her first name is spelled incorrectly on page 49 of the distributed packet. Bruhn noted these mistakes for correction.

Bruhn mentioned that previously used workflows, structure, and technology will all be carried over from the last two-year plan, including the 2020 imagery capture and 2021 planimetric updates. A primary goal of this is to maintain core datasets and revisit the fabric at the project’s tail end, once updated technology and maintenance techniques become available. Another goal is to help clarify what the government does and does not own and be able to trace the histories of properties. A pilot project has been completed containing a database to research and track deeds.

Supervisor Haas noted that City of Milwaukee and Milwaukee County maps sometimes have disparities in ownership. Bruhn responded that that is why the continued goals of Milwaukee County include the ability to provide access to as much historical data as is available.

Stave inquired whether this data shows up in the map or if the changes are displayed elsewhere. Bruhn explained that the maps are primarily used for internal processes to help identify gaps in documents. Bruhn asked if there were any further questions on the proposed two-year plan. None were raised.
Bruhn requested a motion to approve the Land Information Plan for 2019-2021. The motion was made by Mr. Merry, seconded by Ms. Bach, and was approved unanimously.

3. USGS Grant Funds from 2015 Lidar

Bruhn explained that the Lidar needs to be formatted in a specific manner, and the commission received the grant to take on that task. This is also noted in the 2018 budget under ‘Grant List.’ This will need to be recorded by Milwaukee County so that it is available to Audit. Bruhn asked Merry if he could elaborate on the process.

Merry explained that the USGS requires data to be in NAD 83 2011. The first step in the process is developing tools for transformations to relate to federal datums. The next step is to relate them to elevation models. This requires lots of processing to be developed and specifications must be met for admission into this program. Metadata will need to be developed relating to the new federal datums and related services. The cleaned-up data was originally delivered to Milwaukee County in 2013.

X. New Business

No new business was mentioned.

XI. Date, time, and place of next meeting

Bruhn announced that the next LIC meeting will take place on June 4th, 2019. Supervisor Haas checked to make sure this time will work and responded affirmatively.

Bruhn inquired as to where the next meeting should take place. Champagne stated that MMSD would be happy to host again.

XII. Adjournment
## 2018 LIO YTD

<table>
<thead>
<tr>
<th></th>
<th>YTD</th>
<th>YE Projected</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>REVENUES - 2018 YTD</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018 Record &amp; Filing Fees</td>
<td>$775,913</td>
<td>$775,913</td>
</tr>
<tr>
<td>2017 Encumbrances Carried Over</td>
<td>$207,810</td>
<td>$207,810</td>
</tr>
<tr>
<td>2018 Grants</td>
<td>$63,875</td>
<td>$63,875</td>
</tr>
<tr>
<td>2018 Misc Revenue</td>
<td>$1,500</td>
<td>$1,500</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>$1,049,098</td>
<td>$1,049,098</td>
</tr>
</tbody>
</table>

| **OPERATING EXPENSES - 2018 YTD** |          |              |
| 2018 Actual Expenditures      | $839,662   | $839,662     |
| 2018 Encumbrances             | $129,743   | $129,743     |
| 2018 ROD GIS Analyst          | $66,369    | $66,326      |
| **TOTAL**                     | $1,035,773 | $1,035,731   |

2018 Est. Net Income (Loss) $13,325 $13,367

<table>
<thead>
<tr>
<th><strong>Fund Balance:</strong></th>
<th>YTD</th>
<th>YE Projected</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017 Year-End Fund Balance*</td>
<td>$1,604,412</td>
<td>$1,604,412</td>
</tr>
<tr>
<td>2018 Operating Revenues (Shown Above)</td>
<td>+ $1,049,098</td>
<td>$1,049,098</td>
</tr>
<tr>
<td>2018 Exp + Enc for $8 Fee Projects</td>
<td>- $1,035,773</td>
<td>$1,035,731</td>
</tr>
<tr>
<td><strong>2018 Est Fund Balance</strong></td>
<td>= $1,617,737</td>
<td>$1,617,779</td>
</tr>
<tr>
<td>2017 Reserve Revenue @ 10%</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>2018 Est Fund Balance YTD - Unrestricted</td>
<td>$1,590,488</td>
<td>$1,590,530</td>
</tr>
<tr>
<td>2018 Est Fund Balance YTD - Restricted</td>
<td>$27,249</td>
<td>$27,249</td>
</tr>
</tbody>
</table>

*2017 YE Fund Balance represents the current amount in reserve as of 2017 YE close.

**2018 Est YTD Fund Balance represents the 2017 YE reserve netted against the actual 2017 expenditures and revenues. This figure will change throughout the year as additional 2018 expenditures and revenues are realized.

**NOTE:** 2018 expenditures, revenues, and resulting fund balance are year-to-date ONLY. The figures represented in this report are not intended to project a year-end balance for the LIO budget. The purpose of the report is to provide committee members a "financial snapshot" of LIO activities within a specific point in time.
## 2019 LIO YTD

### REVENUES - 2019 YTD Through 03/31/19

<table>
<thead>
<tr>
<th>Description</th>
<th>YTD</th>
<th>YE Projected</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019 Record &amp; Filing Fees</td>
<td>$160,264</td>
<td>$840,000.00</td>
</tr>
<tr>
<td>2018 Encumbrances Carried Over</td>
<td>$129,743</td>
<td>$129,743</td>
</tr>
<tr>
<td>2019 Grants</td>
<td>$1,000</td>
<td>$51,000</td>
</tr>
<tr>
<td>2019 Misc Revenue</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$291,007</strong></td>
<td><strong>$1,020,743</strong></td>
</tr>
</tbody>
</table>

### OPERATING EXPENSES - 2019 YTD Through 03/31/19

<table>
<thead>
<tr>
<th>Description</th>
<th>YTD</th>
<th>YE Projected</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019 Actual Expenditures</td>
<td>$108,892</td>
<td>$891,000.00</td>
</tr>
<tr>
<td>2019 Encumbrances</td>
<td>$113,452</td>
<td>$113,452</td>
</tr>
<tr>
<td>2019 ROD GIS Analyst</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$222,344</strong></td>
<td><strong>$1,004,452</strong></td>
</tr>
</tbody>
</table>

### 2019 Est. Net Income (Loss)

<table>
<thead>
<tr>
<th>Description</th>
<th>YTD</th>
<th>YE Projected</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$68,663</strong></td>
<td><strong>$16,291</strong></td>
</tr>
</tbody>
</table>

### Fund Balance:

<table>
<thead>
<tr>
<th>Description</th>
<th>YTD</th>
<th>YE Projected</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018 Year-End Fund Balance*</td>
<td>$1,605,418</td>
<td>$1,605,418</td>
</tr>
<tr>
<td>2019 Operating Revenues (Shown Above)</td>
<td>+ $291,007</td>
<td>$1,020,743</td>
</tr>
<tr>
<td>2019 Exp + Enc for $8 Fee Projects</td>
<td>- $222,344</td>
<td>$1,004,452</td>
</tr>
<tr>
<td><strong>2019 Est Fund Balance</strong></td>
<td>= <strong>$1,674,081</strong></td>
<td><strong>$1,621,709</strong></td>
</tr>
<tr>
<td>2018 Reserve Revenue @ 10%</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>2019 Est Fund Balance YTD - Unrestricted</td>
<td>$1,563,916</td>
<td>$1,511,544</td>
</tr>
<tr>
<td>2019 Est Fund Balance YTD - Restricted</td>
<td>$110,165.00</td>
<td>$110,165</td>
</tr>
</tbody>
</table>

*2018 YE Fund Balance represents the current amount in reserve as of 2018 YE close.

*2019 Est YTD Fund Balance represents the 2018 YE reserve netted against the actual 2018 expenditures and revenues. This figure will change throughout the year as additional 2019 expenditures and revenues are realized.

**NOTE:** 2019 expenditures, revenues, and resulting fund balance are year-to-date ONLY. The figures represented in this report are not intended to project a year-end balance for the LIO budget. The purpose of the report is to provide committee members a "financial snapshot" of LIO activities within a specific point in time.
<table>
<thead>
<tr>
<th>Vendor Name</th>
<th>Description</th>
<th>Amount Authorized</th>
<th>Amount Paid - Prior Years</th>
<th>Amount Encumbered</th>
<th>Amount Paid 2019 YTD</th>
<th>Canceled Encumbrance</th>
<th>Total Amount Paid (Encumbrances + Actual)</th>
<th>Remaining Unpaid Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOUTHEASTERN WI REGIONAL</td>
<td>County Surveyor</td>
<td>82,916.00</td>
<td>-</td>
<td>82,916.00</td>
<td>-</td>
<td>-</td>
<td>82,916.00</td>
<td></td>
</tr>
<tr>
<td>SOUTHEASTERN WI REGIONAL</td>
<td>2018 Authorized Projects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Vertical Datum Migration</td>
<td>27,249.00</td>
<td>-</td>
<td>27,249.00</td>
<td>-</td>
<td>-</td>
<td>27,249.00</td>
<td>27,249.00</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>$ 110,165.00</td>
<td>$ -</td>
<td>$ 110,165.00</td>
<td>$ -</td>
<td>$ -</td>
<td>$ 27,249.00</td>
<td>$ 110,165.00</td>
</tr>
</tbody>
</table>

2018 YTD Fiscal Report - LIO ($8) - as of 03/31/19
| TASK                                                                 | STATUS         | COMMENTS                                                                                   | PREVIOUS % COMPLETE | CURRENT % COMPLETE | LAST UPDATE | ASSIGNED TO  | START DATE | END DATE | BUDGET       | SPENT TO DATE | REMAINING FUNDS | SOURCE                  |
|----------------------------------------------------------------------|----------------|-------------------------------------------------------------------------------------------|---------------------|--------------------|-------------|--------------|------------|----------|--------------|---------------|----------------|----------------|----------------|
| 1.) Planimetric Data Update                                         | Not Started    | Create change detection product - same process from 2013 and 2015                        | 0                   | 0                  | LIO         | 3/1/2019    | 3/31/2020 |          | $ 50,000     |               | $ 50,000       | Recording Fees |
| 4.) Emergency Management - NG911                                    | In Progress    | Requirements coming from State                                                             | 0                   | 0                  | 12/5/18     | LIO/EOM     | 1/1/2017  | 12/31/2019 | $ -          |               | $ -            | -                   |
| 5.) Cadastral Improvements                                         | In Progress    | Working on multiple areas. Divided into 2 Phases. Cleanup and deep dive errors.           | 37                  | 82                 | 12/5/18     | LIO         | 1/1/2018  | 12/31/2019 | $ 150,000    | $ 75,894       | $ 74,106       | Recording fees - operating budget |
| 6.) Cadastral Improvements - Phase 2                                | Not Started    | Deep dive phase for complex errors - new map products                                      | 0                   | 0                  | LIO         | 12/1/2019  | 12/31/2020 | $ -          |               | $ -            | Current Staffing |
| 7.) Milwaukee County Zoning Data Compilation                        | Complete       | Creating generalized categories                                                           | 0                   | 100                | 12/5/18     | LIO         | 3/1/2018  | 12/31/2019 | $ -          |               | $ -            | Current Staffing |
| 8.) Non-Map GIS                                                    | Not Started    | Behind on Project Workplan                                                                 | 0                   | 0                  | LIO         | 6/1/2018    | 12/31/2019 | $ -          | $ -          | $ -            | Current Staffing |
| 9.) Datum Modernization - Vertical                                 | In Progress    | Technical Processing is underway                                                          | 0                   | 90                 | 12/5/18     | LIO/SEWRPC  | 6/1/2018  | 7/1/2019   | $ 50,000     | $ 4,508        | $ 45,492       | 2017 SI Grant  |

16
MEMORANDUM

TO:            Land Information Council
FROM:          Kevin Bruhn, Land Information Officer
DATE:          May 28, 2019
SUBJECT:       Planimetric Data Update

BACKGROUND

The Planimetric data, (pavement edges, building footprints, pervious\impervious surfaces, waterline, utilities, etc.) has historically been updated after each capture of aerial imagery. This project is to refresh the Milwaukee County data that was completed in 2010 and 2013 and last updated in 2015. The update area has been identified at 4.48 square miles or about 2% of the county. It is the intention of the LIO to start this update in-house later in the year. Previous projects were completed with external resources and usually covered 17 square miles or 7% of the county each time.

ACTIVITIES THIS PERIOD: 12/18 - 6/19

• Performed change detection from 2015 and 2018 imagery and property records
• Created map of change

NEXT

• Create project management documents
• Initiate updates
• Perform quality control

Attached:

Map of update areas
Exhibit of data layers

******
PLANIMETRIC DATA
POTENTIAL UPDATE AREAS
Milwaukee County Land Information Office

Parcels with Updates
Municipal Boundaries

4.84 square miles of parcels
2.0% of total land area
MEMORANDUM

TO:          Land Information Council  
FROM:        Kevin Bruhn, Land Information Officer  
DATE:        May 28, 2019 
SUBJECT:     Cadastral Improvements

BACKGROUND

The process of updating the City of Milwaukee Cadastral data was developed 2017. Differences and inconsistencies were noted between the County and City data and a project to standardize this data was created. A pilot project was started in mid-October of 2017 that looked at 6 quarter sections throughout the City to set a foundation for the project. The findings in the pilot project were consistent throughout the 6 quarter sections and staff determined that it would be feasible to move forward on a County wide project. This project now focuses on the annotation, cartographic lines, geometry issues, and will note additional concerns.

- The annotation cleanup will address such items as varying placement of annotation, overstrikes, spacing, easement, and missing data.
- The cartographic lines will focus on removing the duplicate lines, correcting the subtypes in attributes tables, fixing and the location of lines, and addressing the easement details.
- The geometry issues will focus on the misaligned lines and polygons for Certified Survey Maps, Condominiums, and Subdivisions Plats for current data and historical data.

The final part of this project will quantify additional efforts needed by the staff to address specific problem areas like city and county owned land, editing the Condominium data for consistency, editing of Subdivision and Certified Survey polygons, issues with the parcel data, and right of way line work. All line work changes are validated from recorded deeds and documents. Documents that are used are being attached to the changes for historical reference. The time that is needed to fully research line work changes for phase 2 will be very meticulous and time consuming. A proposed project schedule will be developed near the end of phase 1.

ACTIVITIES THIS PERIOD: 12/8 – 6/19

- 449 of 547 (82%) Sections have been completed
- 331 Phase 2 errors identified

Attached:  Progress Report
Examples of items and tasks
Examples of areas to be cleaned up.

Subdivision Annotation and Cartographic tie lines

Condominiums
Geometry Issues, Easement data, Annotation

Missing Subdivision annotation and cartographic lines
City of Milwaukee Cadastral Update Status
as of May 23, 2019

Legend
EDIT_STATUS
- Phase I Complete (449) 82.2%
- In Progress (13) 2.3%
- Unedited (85) 15.7%

Errors to Resolve in Phase II
Total Errors = 331
MEMORANDUM

TO: Land Information Council
FROM: Kevin Bruhn, Land Information Officer
DATE: May 28, 2019

SUBJECT: Zoning Data Consolidation

BACKGROUND

The Land Information Office has consolidated the parcel zoning data from the municipalities within Milwaukee County. The zoning codes and descriptions vary from municipality within Milwaukee County and this effort was to bring in all of these datasets together to create a seamless coverage. Most zoning categories are able to be aggregated except for residential categories. There is not a consistent method for reporting residential properties. There is a mixture of 1-family, 2-family, general residential, and combined 1 and 2 family residential. At this point, there is not a way to combine this category in a more consistent report.

At this time, the data will not be distributed or submitted to the State of Wisconsin but will be made available as a service and viewing on the Milwaukee County GIS website.

ACTIVITIES THIS PERIOD: 12/18 - 6/19

- 16 of 18 municipalities have zoning zones. 2 municipalities are tied to the parcel
- 305 individual codes aggregated down to 19 categories
- GIS data layer representing generalized zoning
<table>
<thead>
<tr>
<th>General Zoning Category</th>
<th>Zoning Code Count</th>
<th>Unique Zoning Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial or Business Park</td>
<td>62</td>
<td>6, B1, B-1, B2, B-2, B3, B-3, B4, B-4, B-5, B-6, BP, C1, C-1, C2, C-2, C-3, C4, C-4, C9F, C9F(A), C9F(B), C9F(C), CO, C5, D-1, F, LB1, LB2, LB3, O, RB1, RB2, RO, SP-RP, VB</td>
</tr>
<tr>
<td>Residential</td>
<td>42</td>
<td>Unique Zoning Codes</td>
</tr>
<tr>
<td>Institutional</td>
<td>22</td>
<td>4, 4A, C9D, C9D(A), C9D(B), CC, E, F, F, I, I-1, IU, P-1, P-2, S-1, SP-INS, SP-MED, SP-PUB, TL</td>
</tr>
<tr>
<td>Residential: Multi-Family</td>
<td>22</td>
<td>Unique Zoning Codes</td>
</tr>
<tr>
<td>Planned Development</td>
<td>18</td>
<td>9, B1, B-4, BPD, DTSMUPDD, OVPD, PD, PDD, PDD-1, PDD-2, PUD, RPDP</td>
</tr>
<tr>
<td>Industrial</td>
<td>16</td>
<td>IC, IH, IL, IL1, IL2, IM, IO, IO1, IO2, M1, M-1, M2, M-2</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>14</td>
<td>C9H, Lm-1, M, M1, M-1, M-2</td>
</tr>
<tr>
<td>Mixed Use</td>
<td>14</td>
<td>B-2, B-3, B-4, B-5, B-7, C9B, C9B(A), C9B(B), C9G, R3, R4, R5, SP-PKG, TUC-1</td>
</tr>
<tr>
<td>Parks</td>
<td>13</td>
<td>Unique Zoning Codes</td>
</tr>
<tr>
<td>Residential: 1- and 2-Family</td>
<td>10</td>
<td>Unique Zoning Codes</td>
</tr>
<tr>
<td>Residential: 2-Family</td>
<td>9</td>
<td>Unique Zoning Codes</td>
</tr>
<tr>
<td>Transportation</td>
<td>9</td>
<td>7, B-3, B-4, B-5, C3, P-1, SP-PKG, TUC-1</td>
</tr>
<tr>
<td>Environmental</td>
<td>6</td>
<td>C-1, FW, G, M-3, SP-CON</td>
</tr>
<tr>
<td>Agriculture</td>
<td>4</td>
<td>Unique Zoning Codes</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>Unique Zoning Codes</td>
</tr>
<tr>
<td>Unknown</td>
<td>2</td>
<td>Unique Zoning Codes</td>
</tr>
<tr>
<td>Redevelopment</td>
<td>1</td>
<td>Unique Zoning Codes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>General Zoning Category</th>
<th>Taxkey Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential: 1-Family</td>
<td>109,519</td>
</tr>
<tr>
<td>Residential: 2-Family</td>
<td>74,073</td>
</tr>
<tr>
<td>Residential</td>
<td>35,924</td>
</tr>
<tr>
<td>Commercial or Business Park</td>
<td>13,427</td>
</tr>
<tr>
<td>Residential: Multi-Family</td>
<td>12,786</td>
</tr>
<tr>
<td>Planned Development</td>
<td>12,658</td>
</tr>
<tr>
<td>Planned Development: Residential: 1- and 2-Family</td>
<td>10,210</td>
</tr>
<tr>
<td>Industrial</td>
<td>4,605</td>
</tr>
<tr>
<td>Mixed Use</td>
<td>1,980</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>1,361</td>
</tr>
<tr>
<td>Parks</td>
<td>1,164</td>
</tr>
<tr>
<td>Institutional</td>
<td>835</td>
</tr>
<tr>
<td>Retail</td>
<td>666</td>
</tr>
<tr>
<td>Transportation</td>
<td>521</td>
</tr>
<tr>
<td>Redevelopment</td>
<td>499</td>
</tr>
<tr>
<td>Agriculture</td>
<td>358</td>
</tr>
<tr>
<td>Unknown</td>
<td>265</td>
</tr>
<tr>
<td>Environmental</td>
<td>59</td>
</tr>
<tr>
<td>Other</td>
<td>17</td>
</tr>
</tbody>
</table>

Total | 320 |

******

<table>
<thead>
<tr>
<th>General Zoning Category</th>
<th>Taxkey Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential: 1-Family</td>
<td>109,519</td>
</tr>
<tr>
<td>Residential: 2-Family</td>
<td>74,073</td>
</tr>
<tr>
<td>Residential</td>
<td>35,924</td>
</tr>
<tr>
<td>Commercial or Business Park</td>
<td>13,427</td>
</tr>
<tr>
<td>Residential: Multi-Family</td>
<td>12,786</td>
</tr>
<tr>
<td>Planned Development</td>
<td>12,658</td>
</tr>
<tr>
<td>Planned Development: Residential: 1- and 2-Family</td>
<td>10,210</td>
</tr>
<tr>
<td>Industrial</td>
<td>4,605</td>
</tr>
<tr>
<td>Mixed Use</td>
<td>1,980</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>1,361</td>
</tr>
<tr>
<td>Parks</td>
<td>1,164</td>
</tr>
<tr>
<td>Institutional</td>
<td>835</td>
</tr>
<tr>
<td>Retail</td>
<td>666</td>
</tr>
<tr>
<td>Transportation</td>
<td>521</td>
</tr>
<tr>
<td>Redevelopment</td>
<td>499</td>
</tr>
<tr>
<td>Agriculture</td>
<td>358</td>
</tr>
<tr>
<td>Unknown</td>
<td>265</td>
</tr>
<tr>
<td>Environmental</td>
<td>59</td>
</tr>
<tr>
<td>Other</td>
<td>17</td>
</tr>
</tbody>
</table>

Total | 280,927
MEMORANDUM

TO: Mr. Kevin W. Bruhn, GIS Manager-Land Information Officer
FROM: Robert W. Merry, PLS, Milwaukee County Surveyor
DATE: February 13, 2019

SUBJECT: MILWAUKEE COUNTY SURVEYOR ACTIVITIES—2018

This memorandum is intended to provide the GIS Manager-Land Information Officer with a report on the work of the Milwaukee County Surveyor in the calendar year extending from January 1, 2018, through December 31, 2018. The office and the duties and functions of the County Surveyor are prescribed by Section 59.45 of the Wisconsin Statutes. In Milwaukee County the necessary work, pursuant to the direction of the County Board, was funded by document recording fees retained by the County pursuant to Section 59.43(2) of the Wisconsin Statutes. Since the Milwaukee County Land Information Office is charged by contract with administering these retained recording fees, a report to the Council on the activities of the County Surveyor is in order.

Within Milwaukee County, the U.S. Public Land Survey System has been combined with the State Plane Coordinate System and the National Geodetic Vertical Control System to provide the high order horizontal and vertical control survey network required for the preparation and maintenance of the large-scale topographic and cadastral maps. Therefore, the work of the Milwaukee County Surveyor entails not only the maintenance of the U.S. Public Land Survey System as such, but also the maintenance of the horizontal and vertical control survey network. Consequently, the work requires expertise in geodetic, as well as plane surveying, and in the legal aspects of property boundary determination.

Attachment 1 to this memorandum consists of a map of Milwaukee County on which are shown the location of all of the corners of the U.S. Public Land Survey System for which various types of perpetuation activities were undertaken in calendar year 2018. These activities involved the replacement of monuments marking the location of section, quarter section, center of section, witness and meander corners which were reported as damaged, disturbed, or destroyed, by construction, or other activities or actions. The work involved the setting of new monuments; and, as necessary, the replacement of attendant witness marks and benchmarks, the verification or establishment of new State Plane Coordinate values for corner monuments, and elevations for benchmarks. A total of eight corners required the reestablishment of vertical control survey reference benchmarks which in turn created the need for the Commission staff to complete about 9.5 miles of high order differential level lines. New records of U.S. Public Land Survey control station records – dossier sheets – were prepared for each remonumented corner shown on Attachment 1.
A copy of each completed new dossier sheet is provided in Attachment 2 to this memorandum. As indicated on Attachment 1, a total of 18 U.S. Public Land Survey corners were involved in the perpetuation activity from January 1, 2018, through December 31, 2018. In some cases, the perpetuation activity resulted in revised elevations for both the corner monuments concerned and the attendant benchmarks. In such cases, control survey summary diagrams were updated to reflect those changes. A copy of each of the revised diagrams concerned is herewith provided as Attachment 3.

Perpetuation of the corners included, where possible and necessary, the setting of preconstruction witness marks for the corners; remonumentation of the corners; the conduct of high order vertical control surveys to establish the elevations of the corner monuments and of accessories thereto, and the preparation of new dossier sheets for the corners. Where necessary, high order global positioning system (GPS) or conventional traverse surveys were conducted to reestablish, or verify, the state plane coordinate positions of corners.

Preconstruction field work was also completed for 40 U.S. Public Land Survey corners that were expected to require perpetuation due to street and highway or utility reconstruction proposed to be carried out in 2018. These corners are identified on Attachment 1 by open circles. This work included inspection of proposed construction limits at the corner locations; the setting and the measurement of distances to temporary witness marks located outside of the anticipated construction limits; and the transfer of reference benchmark elevations to stable benchmarks set outside of the anticipated construction limits.

It should be noted that, in accordance with Milwaukee County policies relative to the participation and use of disadvantaged business enterprises in the provision of County services, a contract was entered into with the firm of Dakota Intertek Corporation of Milwaukee, Wisconsin—a minority owned firm—to provide assistance to the County Surveyor pertaining to the maintenance of the U.S. Public Land Survey System. More specifically, the contract provided for assistance in the remonumentation of broken or substandard concrete monuments marking the location of corners pertaining to the system. The contract specified nine such monument locations where the contractor was instructed by the County Surveyor as to what type of work was to be performed and the specifications that were to be followed. After completion of such work, the County Surveyor performed an inspection of the monument installations, all of which were found to be in compliance with the specifications governing the work. Payment was made to the contractor in the amount of $17,106.00 on October 6, 2018. This amount constituted 20.6 percent of the total cost of the County Surveyor services, thus exceeding the goal established by Milwaukee County for the participation of a disadvantaged business enterprise in this regard.

Pursuant to State Statutes, Professional Land Surveyors must provide copies of all plats of surveys other than land subdivision plats and certified survey maps conducted within the County to the Office of the County Surveyor for filing. Through December 31, 2018, the County Surveyor received, indexed, and filed 1,050 copies of new land surveys completed in 2018 within the County, bringing the total number of records of land surveys completed within the County, which have been filed with the County Surveyor since the inception of this work in 1984, to 101,341. The filed records are indexed to permit retrieval by name of the surveyor concerned, the property owner concerned, the address of the property concerned, if shown on the plat, the date of the survey plat, the civil division, and the U.S. Public Land Survey Township and Range, and Section and one-quarter section within which the plat is located.

In 2012, the County Surveyor assisted staff in the coordination of an annual program to update the Milwaukee County website in order to incorporate the copies of new land surveys received during the year and those to be received in subsequent years. In 2018, the Land Information Office staff produced digital scans of 1,050 hardcopies, and merged the new files with the existing files to create a total of 101,341 plats of survey that have been filed with the County Surveyor as of December 31, 2018. The purpose and intent of this project was to create a single digital database from the separate databases maintained by the Office
of the County Surveyor and the Milwaukee County Land Information Office to allow the digital images of
the plats of survey to be accessed by the public through the Milwaukee County Interactive Map website.

In 2017, Milwaukee County under a separate agreement with the Commission converted the State Plane
Coordinate positions of all 1,134 USPLSS or System corner monuments within the County from the legacy
datum of the North American Datum of 1927 (NAD27) to the new datum of North American Datum of
1983 with the National readjustment of 2011 (NAD83(2011)). This conversion was completed using the
procedures set forth in Appendix C of the SEWRPC Addendum Memorandum Report No. 206, Revised
Estimate of the Costs of Converting the Legacy Datums within the Region to the New National Datums.
The results of this conversion concluded that the horizontal datum conversion procedures developed by the
Commission staff provided an accurate and cost-effective technique supporting the conversion of the legacy
horizontal datum in use within the Region to the presently promulgated Federal datum – NAD83(2011).
Independent field observation demonstrated that the converted State Plane Coordinate positions of the
monumented County survey control network met Third Order, Class I Standards—providing linear distance
closures of 1 part in 10,000 or better. These results from this conversion can be found in SEWRPC
Technical Report No. 53, Conversion of Horizontal Survey Control Network in Milwaukee County from
Legacy Datum to New Federal Datum. Each of the 1,134 USPLSS or System corner monuments were
updated and a new “Record of U.S. Public Land Survey Control Stations” – so called dossier sheet –
containing survey control station referenced to both the NAD27 and NAD83(2011) datums.

In the fall of 2018, the Commission commenced a Region-wide vertical conversion program going from
the National Geodetic Vertical Datum of 1929 ( NGVD 29) to the North American Vertical Datum of 1988
(NAVD 88) with completion expected in early 2019.

In conjunction with the horizontal and vertical conversion efforts, the Commission continues to assist
Milwaukee County Land Information Office with the conversion efforts of all existing geospatial base
mapping services to the new Federal datums. The assistance includes both training in software that permits
the horizontal and vertical conversion of base mapping, raster, point (i.e., LiDAR), and vector data layers
along with necessary documentation of the above procedures.

* * *

RWM/md
Milwaukee County Surveyor Activities 2018 (00240464-2).DOC

Enclosures

c:  Ms. Marcia G. Cornell, P.E., Manager of Central Drafting and Records, City of Milwaukee
     Department of Public Works
     Mr. Gregory G. High, P.E., Director, Architectural, Engineering and Environmental Services,
     Milwaukee County DAS-FM
     Mr. Daniel R. Talarczyk, Survey Services Supervisor, Milwaukee Metropolitan Sewerage District
     Ms. Mary Dziewiontkoski, Project Programming, City of Milwaukee
Summary of U.S. Public Land Survey System Corner and Control Survey Perpetuation in Milwaukee County: January 1 Through December 31, 2018

Legend
- U.S. Public Land Survey Corners which were remonumented and/or referenced in 2016 (18)
- U.S. Public Land Survey Corners which were remonumented in 2018 but for which referencing will be completed in 2019 due to construction projects not fully completed (40)

Source: SEWRPC.
Wisconsin Land Information Program
County Retained Fee/Grant Report

Instructions:

If your county has accepted a grant under s. 16.967(7) WIS STATS or retained any fees under s.59.72 (5) WIS STATS, submission of this report to the Wisconsin Department of Administration, Division of Intergovernmental Relations is required by June 30th of the following year in accordance with s. 59.72(2)(b) WIS STATS.

<table>
<thead>
<tr>
<th>County</th>
<th>County FIPS</th>
<th>Recording Period: From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milwaukee</td>
<td>079</td>
<td>Jan. 1, 2018</td>
<td>Dec. 31, 2018</td>
</tr>
</tbody>
</table>

Name of Land Information Officer: Kevin Bruhn
Email Address: kevin.bruhn@Milwaukeecountywi.gov
Phone Number: 414-278-3927

1. Amount awarded in WLIP grants under s.16.967(7) Wis. Stats. in the reporting period (Jan. 1 – Dec. 31, 2018) $51,000.00
2. Amount of document recording fees retained under s.59.72(5) Wis. Stats. for land information in the reporting period at $8 per document (Jan. 1 – Dec. 31, 2018) $778,680.00
3. Total amount of grants and retained fees provided through the WLIP in 2018 $829,680.00

Brief narrative or bulleted summary of 2018 land information activities, including relevant web-links:

- Orthophotography/Oblique imagery capture from Eagleview Technologies
- Completed 50% of the cadastral improvements for the City of Milwaukee
- Cadastral updates for all 19 municipalities of Milwaukee County
- Quarterly aggregation and compilation of address and cadastral mapping updates, maintained by Milwaukee County and the City of Milwaukee, data is made available on public website.
- Facilitated the 17th Milwaukee Municipal GIS Users Group (MMGUG) Meeting, November 8th
- Conducted June, and December Land Information Council Meetings.
- Georeferenced 1894 Sanborn mapping
- Integration of eRTR DOR data with Fidlar parcel ownership information for published quarterly updates
- Vertical Datum Migration from NAD27 to NAD83
- Data and service migration from NAD27 to NAD83
- Completed Charter and Bylaws for the Milwaukee County Land Information Council
- Participated in the Census Bureau LUCA program
## Wisconsin Land Information Program
### County Retained Fee/Grant Report – Continued

<table>
<thead>
<tr>
<th>Land Info Spending Category</th>
<th>Project Title(s)</th>
<th>Land Info Plan Citations</th>
<th>Project Cost Note unit cost and project total for each project</th>
<th>Total Cost for Spending Category (ONE total per Spending Category)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital Parcel Mapping</td>
<td>Cadastral Maintenance: All 19 Municipalities</td>
<td>LRM: 2015, II.P7</td>
<td>$129,235.85 2 FTE $41,152.65 LTE</td>
<td>$170,388.50</td>
</tr>
<tr>
<td></td>
<td>Cadastral Improvements – City of Milwaukee</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PLSS</td>
<td>Milwaukee County Surveyor Services</td>
<td>LRM: 2015, II.P6</td>
<td>$82,916 $27,249 (SEWRPC)</td>
<td>$110,165</td>
</tr>
<tr>
<td>Other Parcel Work</td>
<td>Vertical Datum Modernization – NAD 83</td>
<td>LRM: 2015, II.P8</td>
<td>1,125 Platt Scans @ $.33 per</td>
<td>$371.25</td>
</tr>
<tr>
<td>(e.g., ROD indexing)</td>
<td>Plat of Survey parcel index maintenance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LIDAR</td>
<td>LP360 Software Renewal</td>
<td>LRM: 2015, II.P9</td>
<td>$936.28</td>
<td>$936.28</td>
</tr>
<tr>
<td>Orthoimagery</td>
<td>2018 3” Ortho/Oblique Imagery</td>
<td>LRM: 2015, II.P10</td>
<td>$37,286</td>
<td>$37,286</td>
</tr>
<tr>
<td>Address Points</td>
<td>Enterprise Address System</td>
<td>LRM: 2015, II.P10-11</td>
<td>.25 FTE</td>
<td>$19,717.50</td>
</tr>
<tr>
<td>Street Centerlines</td>
<td>Street Centerline Maintenance</td>
<td>LRM: 2015, II.P10-11</td>
<td>.25 FTE</td>
<td>$19,717.50</td>
</tr>
<tr>
<td>Software</td>
<td>Latitude Geographics GeoCortex ESRI Geocue - Blue Marble</td>
<td>LRM: 2015, III.P18</td>
<td>$6,853.75 Latitude $38,459 ESRI $449.10 BlueMarble</td>
<td>$45,761.85</td>
</tr>
<tr>
<td>Hardware</td>
<td>MCLIO Infrastructure Administration, Infrastructure and Hardware purchases</td>
<td>LRM: 2015, III.P17-19</td>
<td>$92,083 1 FTE $34,018.65 Charges $1,154.22 Hardware</td>
<td>$127,255.87</td>
</tr>
<tr>
<td></td>
<td>Including Cross Charge</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Website Development/</td>
<td>LIO Website support, GIS Website support - HTML5</td>
<td>LRM: 2015, IV.P20</td>
<td>$78,870 .5 FTE</td>
<td>$39,435</td>
</tr>
<tr>
<td>Hosting Services</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Administrative Activities</td>
<td>Milwaukee County Land Information Office (MCLIO) Operations and Project</td>
<td>LRM: 2015, III.P17-19</td>
<td>$97,820 1 FTE $1,154.22 Supplies $34,018.65 Admin $116,547.56 Legacy</td>
<td>$233,671.59</td>
</tr>
<tr>
<td>and Management</td>
<td>Management &amp; Staffing, Data Requests, Dept Admin, legacy costs and overhead</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>costs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Training and Education</td>
<td>esri Developers Summit, WLIA Annual and Regional, Metro Milwaukee User Group</td>
<td>LRM: 2015, III.P17-19</td>
<td>$536.13 WLIA $2,898.51 esri Dev $200 User Group</td>
<td>$3,998.95</td>
</tr>
<tr>
<td>Other (specify in second</td>
<td>1894 Sanborn fire insurance mapping - georectification, mosaic and service</td>
<td></td>
<td>$23,726 .5 Intern</td>
<td>$11,863</td>
</tr>
<tr>
<td>column)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td></td>
<td>$831,897.86</td>
</tr>
</tbody>
</table>

Amount of retained fees and grants spent on land records modernization in the reporting period. Total may be more or less than the amount of grants awarded and fees retained in 2018 (if carried over from year to year). Amount of retained fees and grants carried forward to calendar year 2019 from previous years $1,605,418.29
MEMORANDUM

TO: Land Information Council
FROM: Kevin Bruhn, Land Information Officer
DATE: May 28, 2019
SUBJECT: 2020 LiDAR Capture

BACKGROUND
Milwaukee County has been collecting Light Detection and Ranging, LiDAR, in intervals of 5 year acquisitions. This has been done in 2010 and 2015. A 2020 collection is a continuation of this program. One notable change in for this collection is the resolution of the data. Previous collections were done at 1.7 points per meter. This acquisition will be at 30 points per meter.

This will allow the county, its partners, and private business to perform transportation planning with design related applications, vegetation analysis, building modeling, micro drainage analysis, shoreline erosion analysis, utility asset extraction, and hydraulic modeling.

The State of Wisconsin Department of Transportation is willing to contribute to the collection of the high resolution LiDAR to support their design needs in Milwaukee County. The proposed contribution is estimated to be $25,000.

<table>
<thead>
<tr>
<th>GRANTS</th>
<th>COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020 LiDAR</td>
<td>$99,788</td>
</tr>
<tr>
<td>2019 STARTEGIC INITIATIVE GRANT</td>
<td>$50,000</td>
</tr>
<tr>
<td>WI DOT CONTRIBUTION</td>
<td>$25,000</td>
</tr>
<tr>
<td>FINAL TOTAL</td>
<td>$24,788</td>
</tr>
</tbody>
</table>

ACTIVITIES THIS PERIOD – 12/18 – 6/19
1. Meeting 4/9/19, of 7 County LIO’s to gauge interest in LiDAR
2. General cost menu for high resolution elevation products

NEXT
• Complete contract for LiDAR from Ayres/Quantum Spatial.

Attached:
Sample solution from Ayres\Quantum Spatial
Scope of services from Ayres\Quantum Spatial
Sensor capabilities collection benefits
Utility Analytics

Precisely modeling utility assets – conductors, poles, transformers, guys – represents one of the most significant challenges for using LiDAR. The challenge is magnified with distribution lines (as opposed to transmission) and in dense neighborhoods, because:

- Distribution lines are typically much smaller in diameter compared to transmission conductors, providing a much smaller target to reflect the LiDAR energy.
- Older neighborhoods typically have older conductors strung along the poles, where the reflective properties degrade over time.
- Older neighborhoods also have mature trees that tend to obscure assets falling within the tree canopy.

Riegl Advantage

All sensors perform differently with this detection, which is mainly a function of:

- Laser power
- Beam divergence
- Detection optics

The 1550A is best in class for the detection of fine features with LiDAR

Topographic Modeling

From coastlines to mountaintops, high-density LiDAR data has shed new light on topography to support a diversity of land management, engineering, or planning initiatives. Enhanced surface modeling allows for more effective flood hazard mapping, inundation mapping, stream network updates, precision agriculture, watershed erosion studies, marine resource evaluations, snowpack measurements, and nationwide elevation coverage (USGS, 2019).

Forest Inventory & Research

High density LiDAR enables the precise inventory of forest resources at large spatial scales. Biomass can be calculated to estimate biomass, fuels, carbon, and forest health. From individual trees to entire watersheds or ownerships, high density LiDAR provides baseline data critical for effective forest management and monitoring efforts.

Built Environment Modeling & Urban Planning

With increasing urbanization and the need for complex city planning, high density LiDAR data captures man-made features in unparalleled detail and accuracy, allowing public works planners and civil engineers with the data they need for accurate impervious surface classifications and LiDAR-derived planimetrics.

Infrastructure & Engineering Design

High density LiDAR supports transportation design, utilities mapping, navigation, and coastal/inshore public works infrastructure (levees, jetties, dams, reservoirs) through access to dense elevation point clouds, TINs, and detailed contour lines. Airborne, Mobile, or UAS LiDAR mapping can be used to capture existing infrastructure to make informed engineering decisions.

Natural Hazards Planning & Emergency Response

When disaster strikes, QSS’s aircraft and crew can mobilize within 24 hours anywhere in the U.S. Timely geospatial data can enhance evacuation planning, site access planning, route detouring, and emergency response. High density LiDAR applications for hazard planning include detecting, evaluating or monitoring landslides, faults, volcanic activity, storm damage patterns, dam failure, aviation safety, and flood inundation risk.

Habitat Mapping

High density LiDAR data supports wildlife biologists and land managers with useful broadscale land cover or land use data for habitat protection, restoration design, population monitoring, and invasive species analysis.
Dear Rob:

Thank you for the opportunity to submit this proposal for lidar services for Milwaukee County in 2020. This letter describes the project approach, specifications, and fees for countywide high density lidar. The total project area is 247 square miles, which includes a 100 meter buffer around the County. Please refer to the Exhibit A for a map of the project area. The Ayres Associates/Quantum Spatial team will provide the following services.

**Lidar Scope of Services**

SEWRPC and Milwaukee County understand the importance updating elevation base data on a regular basis. In 2020, the County is considering a high density lidar project to take advantage of new technologies and to support its business needs and the needs of its constituents.

The County completed its previous lidar project in 2015. Lidar technology has advanced significantly since that time, and the County would like to take advantage of these advancements by collecting high density, high accuracy lidar data. The County can leverage the high density lidar data for transportation planning and design related applications, vegetation analysis, building modeling, micro drainage analysis, shoreline erosion analysis, utility asset extraction, and hydraulic modeling among uses.

**Lidar Project Approach**

Ayres Associates understands that the proposed Lidar project calls for the development of high accuracy topographic mapping and above ground modeling across 247 square miles (county-wide) in Milwaukee County. The lidar data collection will be done using a low altitude fixed wing aircraft equipped with an advanced lidar sensor and an airborne GNSS/IMU system for accurate georeferencing. The lidar point cloud will be captured during the spring leaf-off state, and when clouds or haze are not present between the aircraft and the ground.

The lidar will be collected at 30 points per square meter nominal pulse density. The lidar will achieve Quality Level 0 (QL0) vertical accuracy as defined by USGS Lidar Base Specifications, which equates to 5 cm RMSEz on level or uniformly sloped non-vegetated ground.

The raw lidar point cloud will be calibrated and then classified according base classification scheme listed below. All collected Lidar points will be retained in the point cloud according to these classifications. As an option, high vegetation and building classifications can be done using automated routines.

Lidar Base Classification Scheme:
1: Processed, but unclassified
2: Bare earth
7: Low noise
9: Water
17: Bridge deck
18: High noise
20: Ignored ground (breakline proximity)
Hydro breaklines will be collected for hydro flattening of ponded water bodies and ensuring proper downhill gradients for flowing water. A bare earth digital surface model for the project area will be generated from the processed lidar data and will support the generation of contours at 1-foot contour intervals.

**Lidar Ground Control**

Ayres Associates will use the airborne GNSS/IMU data collected at the time of flight to reduce the required amount of ground control. We will use WisCORS data collected during the flight from nearby permanent base stations to calibrate the raw lidar data. Ayres Associates will survey 20-25 ground control points across the county that will be used to validate the calibration of the raw lidar data.

**Coordinate System and Datum**

The lidar data will be delivered in Wisconsin State Plane Coordinates, South Zone. The horizontal datum will be NAD83 (2011), US Survey Feet, and the vertical datum will be NAVD88 (Geoid 12B), US Survey Feet.

**Lidar Project Deliverables**

Deliverable products included in the above proposal are as follows:

- Base lidar datasets to meet USGS QL0 for point density and vertical accuracy
  - Classified point cloud, LAS 1.4 format
  - Hydro flattening breaklines (100-ft streams and 2 acre ponds), shapefile format
  - Bare earth DEM, 1-ft pixel, 32-bit floating point grid
  - Tile schematic, shapefile format
  - Ground control report, PDF format
  - Data acquisition and processing reports, PDF format

**Lidar Enhancements and Derivatives**

The following list of enhancements and deliverables is being provided for your consideration as you plan for this project. We can provide budgets for each of these derivatives individually, but these are not included in the proposed base project fees.

Recommended lidar enhancements to the base QL0 requirements (not included in Proposed Fees):

- Improved hydro breaklines (20-ft and wider streams and 2 acre ponds)
- 1-ft contour dataset (topologically cleaned, four contour types)
- Bare earth point cloud – class 2 points only
- Automated classification of high vegetation and buildings (classes 5 and 6)
- Vertical accuracy field survey and report generation (NVA and VVA)

Additional lidar derivative datasets for consideration (not included in Proposed Fees):

- Further improved hydro breaklines (8-ft and wider streams and 1-acre and larger ponds)
- Highway corridor point cloud ribbons and surface models
- Transportation and utility asset extraction, points and vectors
- 2D building outlines generated from building points
- 3D buildings generated from building points
- Tree canopy polygons from high vegetation points
- Intensity imagery
- Digital Surface Model (DSM) of first returns
- Culvert collection and hydro-enforced DEM
- Cloud hosting and delivery of point cloud and derivatives
Proposed Fees:
The following pricing is **not-to-exceed** lump sum amount for the countywide base lidar services listed in this proposal.

Lidar Base Project:
Lidar acquisition and processing of 30 ppsm data countywide: $99,788.00

I hope that we have provided the information you require to proceed with planning for this important lidar project in 2020. If you need additional information or clarification on the proposal details, please feel free to contact me at 608.443.1207.

Sincerely,

Zachary J. Nienow, GISP
Ayres Associates Inc
Project Manager – Aerial Mapping Group
Direct: 608.443.1207
NienowZ@AyresAssociates.com
Exhibit A

Milwaukee County Project Area, 247 square miles including 100 meter buffer:
Riegl 1560i LiDAR Sensor

In 2017, in collaboration with key clients and Ayres Associates, Quantum Spatial performed a rigorous evaluation of the relative performance of the next generation of commercial linear-mode LiDAR sensors. Our analyses included comparison of various parameters, including number of valid returns, the distribution of returns by height above ground, and intensity values and distribution. From this, we have determined that for high density LiDAR applications, the Riegl VQ-1560i outperforms all other sensors currently on the market. Our 2017 purchase of the sensor has enabled us to more readily provide high density LiDAR of superior quality to Quantum Spatial and Ayres Associates clients, and many of our clients are now adopting 1560i specifications and requesting use of the sensor for their LiDAR programs. The following provides an overview and justification for our recommendation to employ the 1560i for the project areas in SE Wisconsin. The 1560i clearly represents the best value for cost for high density LiDAR applications. With the region’s increasing use of high density LiDAR, the use of LiDAR data from this sensor will enhance the information that can be extracted from the LiDAR point cloud and hence the value of the datasets to the Region’s foresters, land information officers, planners, engineers, and other decision-makers.

Sensor Capabilities

The Riegl VQ-1560i instrument features dual channel laser scanners, a laser pulse repetition rate of up to 2 MHz (> 1.3 million ground measurements per second), high performance IMU/GNSS system, a large field of view (58 degrees), forward/backward scan angle and a matrix scan pattern. The sensor operates at high altitudes (up to 15,500 ft) allowing for greater versatility, efficiency, and speed of acquisition for cost effective data collections at high pulse densities. The ability to fly at higher altitudes than traditional sensors renders it ideally suited for large area acquisitions.

One of the most unique and innovative features increasing performance and efficiency of the Riegl sensor is the advanced scan pattern - forward/backward (8 degree from nadir) look capability as well as offset laser channels (± 14 degrees) which provide for even and dense point spacing over variable terrain elevations. As illustrated (right), the sensor utilizes two laser sensors that scan in a synchronized cross-fire pattern that passes through the nadir position, increasing the probability of ground returns in heavily vegetated environments. This configuration allows for more effective and accurate data capture from multiple angles to more efficiently achieve higher point densities compared to traditional scanners where there is a greater chance that points from different flight lines “bunch up”.

In addition, the fully integrated and calibrated dual laser Multiple-Time-Around (MTA) airborne processing software, echo digitization, and full-waveform capability of the 1560i facilitate a range of options for multiple-target detection. The MTA processing allows handling more than 10 pulses in the air simultaneously which is a significant consideration over the forested and urbanized areas found in SE Wisconsin.

With the Riegl 1560i matrix scan pattern, each laser channel is rotated ± 14 degrees from parallel to create the most optimal matrix scanning pattern of any LiDAR scanner available today. Graphics courtesy of Riegl.
Example Application: Greater Resolution of Forest Structure

Derivation of canopy structure metrics from the LiDAR such as height, crown size and canopy cover, and of derived variables such as basal area, DBH, volume, and potentially species, is greatly enhanced with improved differentiation of mid-canopy structure. As with photon counting sensors, number of points is not necessarily a good indication of information content. However, the strong signal to noise ratio of the Riegl 1560i means that most of the points recorded represent real features in the canopy. The Riegl 1560i’s ability to produce up to 7 returns per laser pulse (other sensors provide up to 4) improves the probability of canopy penetration, resulting in a higher density of ground and near-ground returns. Moreover, with a significant increase in native pulse density to ≥ 30 pulses/m², we will see further improvement in the differentiation of sub-canopy features.

Better Intensities

Accurate normalized intensity values across flight lines and project areas is critical to ensure the precision of above-ground vegetation classification. For all QSI sensors, we have developed effective methodologies to normalize intensities with respect to gain, laser power, atmospheric transmissivity, and laser scan angle resulting in a more useable intensity image. Variability in intensity values across the same target is minimized mathematically to arrive upon a normalized intensity value that approaches a true radiometric value for each discrete LiDAR return. In addition, the collection of consistent intensity data for large projects likewise requires close attention to consistent collection parameters - same sensor type and settings, and consistent time of year with respect to ground conditions.
The quality of intensity normalization depends on the sensor used. The Riegl 1560i has been engineered with specific attention to providing a high-value intensity image. Unlike most other sensors, it calibrates and normalizes the intensity, providing both return amplitude and reflectance values. This reflectance value corrects for the scan angle, return range and the power of the laser pulse from the measured amplitude of the return, normalizing the reflectance intensity in a uniform manner across the dataset. The information is captured in 16 bits, preserving fine scale differences in the surface reflectivity in the near infra-red band, which relates to the species and health of the vegetation. This information in conjunction with the LiDAR spatial resolution and accuracy significantly advances the accuracy and resolution of vegetation classification for forest inventory, restoration and planning. Compared to the information typically gained by pairing spectral data (imagery) with LiDAR, the coincident intensity and height information available from 1560i LiDAR alone is certainly more cost effective, and providing detailed spectral data for land cover mapping.

Higher Value for the Same Cost

The team of Quantum Spatial and Ayres Associates proposes flying the SE Wisconsin region at a 30 pulses/m² density with the advantage of next generation features. The next generation LiDAR sensors allow an increase in flight efficiency. This feature allows for an increase in the pulse density spec (to ≥ 30 pulses/m²) for forestry, urban mapping, engineering, and other applications with relatively minimal impact on project costs. The higher point density and greater canopy penetration of the 1560i is of particular interest in a mixed suburban/urban/forested area such as SE Wisconsin because it will allow improved characterization of the canopy and improved penetration to the ground so that the understory and the ground are delineated better. With the 1560i, LiDAR users can receive higher density LiDAR with greater canopy penetration and superior intensity information at a minimal additional cost vs the market rate for standard density LiDAR data.

Calibrated reflectance values for a high density (≥ 30 pulses/m²) LiDAR acquisition using the Riegl 1560i. This dataset was captured during 2017-2018. The different colors consistently represent different vegetation and forest types across the study area.
MEMORANDUM

TO: Land Information Council
FROM: Kevin Bruhn, Land Information Officer
DATE: May 28, 2019
SUBJECT: 2020 Ortho and Oblique Imagery Capture

BACKGROUND
The Southeast Wisconsin Regional Planning Commission organizes the regional orthophoto acquisition every 5 years. The Land Information Officers from the 7 Counties of the SEWRPC region are planning to capture imagery for the extents of the SEWPRC area. Federal Transportation and Planning grants have been identified at $200,000 to assist with the acquisition of this regional flight. The estimated grant portion for Milwaukee County is $18,032. There is also a rebate from the Vertical Datum Migration project of 2019 that will be about $22,741. This is from over estimation of project complications and length.

The cost schedule has been generated from Eagle View formally known as Pictometry, the vendor for the oblique products that Milwaukee County historically utilizes. The resolution of this flight is consistent with the previous three flights before at a nominal 3 inch, oblique and ortho.

<table>
<thead>
<tr>
<th>GRANTS</th>
<th>COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020 IMAGERY</td>
<td>$137,286</td>
</tr>
<tr>
<td>2020 STARTEGIC INITIATIVE GRANT</td>
<td>$40,000</td>
</tr>
<tr>
<td>2018 STARTEGIC INITIATIVE GRANT CARRYOVER</td>
<td>$22,741</td>
</tr>
<tr>
<td>SEWRPC CONTRIBUTION</td>
<td>$18,032</td>
</tr>
<tr>
<td>FINAL TOTAL:</td>
<td>$56,513</td>
</tr>
</tbody>
</table>

ACTIVITIES THIS PERIOD – 12/18 – 6/19
1. Meeting 4/9/19, of 7 County LIO’s to coordinate level of imagery resolution needed
2. General cost menu for imagery products

NEXT
- Complete contract for imagery from Eagle View\Pictometry.

Attached:
- Wisconsin Regional Orthophoto Consortium schedule
- 2020 Eagleview imagery capture agreement

******
### WROC 2020 - 6"

<table>
<thead>
<tr>
<th>County</th>
<th>Area (sq mi)</th>
<th>$80/sq mi</th>
<th>Commission</th>
<th>County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kenosha</td>
<td>272</td>
<td>$21,760</td>
<td>$17,408</td>
<td>$4,352</td>
</tr>
<tr>
<td>Milwaukee</td>
<td>241</td>
<td>$19,280</td>
<td>$15,424</td>
<td>$3,856</td>
</tr>
<tr>
<td>Ozaukee</td>
<td>233</td>
<td>$18,640</td>
<td>$14,912</td>
<td>$3,728</td>
</tr>
<tr>
<td>Racine</td>
<td>333</td>
<td>$26,640</td>
<td>$21,312</td>
<td>$5,328</td>
</tr>
<tr>
<td>Walworth</td>
<td>577</td>
<td>$46,160</td>
<td>$36,928</td>
<td>$9,232</td>
</tr>
<tr>
<td>Washington</td>
<td>436</td>
<td>$34,880</td>
<td>$27,904</td>
<td>$6,976</td>
</tr>
<tr>
<td>Waukesha</td>
<td>581</td>
<td>$46,480</td>
<td>$37,184</td>
<td>$9,296</td>
</tr>
</tbody>
</table>

**Totals** | **2673** | **$213,840** | **$171,072** | **$42,768** |

### WROC 2020 - 3"

<table>
<thead>
<tr>
<th>County</th>
<th>Area (sq mi)</th>
<th>$250/sq mi</th>
<th>Commission</th>
<th>County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kenosha</td>
<td>272</td>
<td>$68,000</td>
<td>$20,352</td>
<td>$47,648</td>
</tr>
<tr>
<td>Milwaukee</td>
<td>241</td>
<td>$60,250</td>
<td>$18,032</td>
<td>$42,218</td>
</tr>
<tr>
<td>Ozaukee</td>
<td>233</td>
<td>$58,250</td>
<td>$17,434</td>
<td>$40,816</td>
</tr>
<tr>
<td>Racine</td>
<td>333</td>
<td>$83,250</td>
<td>$24,916</td>
<td>$58,334</td>
</tr>
<tr>
<td>Walworth</td>
<td>577</td>
<td>$144,250</td>
<td>$43,172</td>
<td>$101,078</td>
</tr>
<tr>
<td>Washington</td>
<td>436</td>
<td>$109,000</td>
<td>$32,622</td>
<td>$76,378</td>
</tr>
<tr>
<td>Waukesha</td>
<td>581</td>
<td>$145,250</td>
<td>$43,472</td>
<td>$101,778</td>
</tr>
</tbody>
</table>

**Totals** | **668,250** | **$200,000** | **$468,250** |

### Impervious/Nonimpervious

<table>
<thead>
<tr>
<th>County</th>
<th>Urban</th>
<th>Suburban</th>
<th>Rural</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kenosha</td>
<td>$85,680</td>
<td>$87,040</td>
<td>$106,080</td>
<td>$278,800</td>
</tr>
<tr>
<td>Milwaukee</td>
<td>$404,880</td>
<td>$77,120</td>
<td>$16,080</td>
<td>$482,080</td>
</tr>
<tr>
<td>Ozaukee</td>
<td>$73,395</td>
<td>$93,200</td>
<td>$83,880</td>
<td>$250,475</td>
</tr>
<tr>
<td>Racine</td>
<td>$104,895</td>
<td>$133,200</td>
<td>$119,880</td>
<td>$357,975</td>
</tr>
<tr>
<td>Walworth</td>
<td>$60,585</td>
<td>$147,712</td>
<td>$273,498</td>
<td>$481,795</td>
</tr>
<tr>
<td>Washington</td>
<td>$183,120</td>
<td>$111,616</td>
<td>$167,424</td>
<td>$462,160</td>
</tr>
<tr>
<td>Waukesha</td>
<td>$183,015</td>
<td>$325,360</td>
<td>$174,300</td>
<td>$682,675</td>
</tr>
</tbody>
</table>

**Totals** | **$1,095,570** | **$975,248** | **$925,062** | **$2,995,880** |

### WROC 2020 - 3" (Revised)

<table>
<thead>
<tr>
<th>County</th>
<th>$195/sq mi</th>
<th>Commission</th>
<th>County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kenosha</td>
<td>$20,351</td>
<td>$20,351</td>
<td>$18,032</td>
</tr>
<tr>
<td>Milwaukee</td>
<td>$45,435</td>
<td>$24,916</td>
<td>$40,019</td>
</tr>
<tr>
<td>Ozaukee</td>
<td>$45,435</td>
<td>$43,172</td>
<td>$69,343</td>
</tr>
<tr>
<td>Racine</td>
<td>$85,020</td>
<td>$32,622</td>
<td>$52,397</td>
</tr>
<tr>
<td>Walworth</td>
<td>$113,295</td>
<td>$43,472</td>
<td>$69,823</td>
</tr>
</tbody>
</table>

**Totals** | **$421,200** | **$200,000** | **$259,583** |

### LiDAR - 30 PPM / 5cm Vert Accuracy

<table>
<thead>
<tr>
<th>County</th>
<th>Area (sq. mi.)</th>
<th>$360/sq. mi.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kenosha</td>
<td>272</td>
<td>$97,920</td>
</tr>
<tr>
<td>Milwaukee</td>
<td>241</td>
<td>$86,760</td>
</tr>
<tr>
<td>Ozaukee</td>
<td>233</td>
<td>$83,880</td>
</tr>
<tr>
<td>Racine</td>
<td>333</td>
<td>$119,880</td>
</tr>
<tr>
<td>Walworth</td>
<td>577</td>
<td>$207,720</td>
</tr>
<tr>
<td>Washington</td>
<td>436</td>
<td>$156,960</td>
</tr>
<tr>
<td>Waukesha</td>
<td>581</td>
<td>$209,160</td>
</tr>
</tbody>
</table>

**Totals** | **2673** | **$962,280** |

### Impervious/Nonimpervious

<table>
<thead>
<tr>
<th>Category</th>
<th>Range</th>
<th>Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>450-600</td>
<td>525</td>
</tr>
<tr>
<td>Suburban</td>
<td>320-480</td>
<td>400</td>
</tr>
<tr>
<td>Rural</td>
<td>120-180</td>
<td>150</td>
</tr>
</tbody>
</table>

**Note:** The above costs are based on 1/4 section and are only budgetary and will change based on areas to be mapped. Commission used Rural/Urban percentages from Comprehensive Plan and took some percentages from each to make Suburban Category as provided.
AGREEMENT BETWEEN
PICTOMETRY INTERNATIONAL CORP. ("PICTOMETRY") AND
MILWAUKEE COUNTY, WI ("CUSTOMER")

1. This order form ("Order Form"), in combination with the contract components listed below:

Section A: Product Descriptions, Prices and Payment Terms
Section B: License Terms:
• Delivered Content Terms and Conditions of Use
• Online Services General Terms and Conditions
• Web Visualization Offering Terms and Conditions
• Software License Agreement
Section C: Non-Standard Terms and Conditions
Appendix 1: Photogrammetric Product Specifications
Sector Map

(all of which, collectively, constitute this "Agreement") set forth the entire understanding between Pictometry and Customer with respect to the subject matter hereof and supersedes all prior representations, agreements and arrangements, whether oral or written, relating to the subject matter hereof. Any modifications to this Agreement must be made in writing and be signed by duly authorized officers of each party. Any purchase order or similar document issued by Customer in connection with this Agreement is issued solely for Customer’s internal administrative purposes and the terms and conditions set forth on any such purchase order shall be of no force or effect as between the parties.

2. In the event of any conflict among any contract components comprising this Agreement, order of precedence for resolving such conflict shall be, from highest (i.e., supersedes all others) to lowest (i.e., subordinate to all others): Non-Standard Terms and Conditions; Photogrammetric Product Specifications; Product Descriptions, Prices and Payment Terms; License Terms in order as listed above under the heading ‘Section B: License Terms’; and Order Form.

3. All notices under this Agreement shall be in writing and shall be sent to the following respective addresses:

<table>
<thead>
<tr>
<th>CUSTOMER NOTICE ADDRESS</th>
<th>PICTOMETRY NOTICE ADDRESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>633 W Wisconsin Ave</td>
<td>25 Methodist Hill Drive</td>
</tr>
<tr>
<td>Suite 903</td>
<td></td>
</tr>
<tr>
<td>Milwaukee, WI 53203</td>
<td>Rochester, NY 14623</td>
</tr>
<tr>
<td>Attn: Kevin Bruhn, Land Information Officer</td>
<td>Attn: General Counsel</td>
</tr>
<tr>
<td>Phone: (414) 278-3927</td>
<td>Phone: (585) 486-0093</td>
</tr>
<tr>
<td></td>
<td>Fax: (585) 486-0098</td>
</tr>
</tbody>
</table>

Either party may change their respective notice address by giving written notice of such change to the other party at the other party’s then-current notice address. Notices shall be given by any of the following methods: personal delivery; reputable express courier providing written receipt; or postage-paid certified or registered United States mail, return receipt requested. Notice shall be deemed given when actually received or when delivery is refused.

4. This Agreement, including all licenses granted pursuant to it, shall be binding upon and inure to the benefit of the parties hereto, their successors and permitted assigns, but shall not be assignable by either party except that (i) Pictometry shall have the right to assign its right to receive Fees under this Agreement, provided no such assignment shall affect Pictometry’s obligations hereunder, and (ii) Pictometry shall have the right to assign all its rights under this Agreement to any person or entity, provided the assignee has assumed all of Pictometry’s obligations under this Agreement.

5. IN NO EVENT SHALL EITHER PARTY BE LIABLE, UNDER ANY CAUSE OF ACTION OF ANY KIND ARISING OUT OF OR RELATED TO THIS AGREEMENT (INCLUDING UNDER THEORIES INVOLVING TORT, CONTRACT, NEGLIGENCE, STRICT LIABILITY, OR BREACH OF WARRANTY), FOR ANY LOST PROFITS OR FOR ANY INDIRECT, INCIDENTAL, CONSEQUENTIAL, PUNITIVE, OR OTHER SPECIAL DAMAGES SUFFERED BY THE OTHER PARTY OR OTHERS, EVEN IF A PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

6. With respect to any claims that Customer may have or assert against Pictometry on any matter relating to this Agreement, the total liability of Pictometry shall, in the aggregate, be limited to the aggregate amount received by Pictometry pursuant to this Agreement.

7. The waiver by either party of any default by the other shall not waive subsequent defaults of the same or different kind.
8. In the event that any of the provisions of this Agreement shall be held by a court or other tribunal of competent jurisdiction to be unenforceable, such provision will be enforced to the maximum extent permissible and the remaining portions of this Agreement shall remain in full force and effect.

9. Pictometry shall not be responsible for any failure on its part to perform due to unforeseen circumstances or to causes beyond Pictometry's reasonable control, including but not limited to acts of God, war, riot, embargoes, acts of civil or military authorities, fire, weather, floods, accidents, strikes, failure to obtain export licenses or shortages or delays of transportation, facilities, fuel, energy, supplies, labor or materials. In the event of any such delay, Pictometry may defer performance for a period of time reasonably related to the time and nature of the cause of the delay.

10. In consideration of, and subject to, payment by Customer of the Fees specified in Section A of this Agreement, Pictometry agrees to provide Customer with access to and use of the products specified in Section A of this Agreement, subject to the terms and conditions set forth in this Agreement. Customer hereby agrees to pay the Fees specified in Section A of this Agreement in accordance with the stated payment terms and accepts and agrees to abide by the terms of this Agreement.

This Agreement shall become effective upon execution by duly authorized officers of Customer and Pictometry and receipt by Pictometry of such fully executed document, such date of receipt by Pictometry being the "Effective Date."

PARTIES:

<table>
<thead>
<tr>
<th>CUSTOMER</th>
<th>PICTOMETRY</th>
</tr>
</thead>
<tbody>
<tr>
<td>MILWAUKEE COUNTY, WI</td>
<td>PICTOMETRY INTERNATIONAL CORP.</td>
</tr>
<tr>
<td>(entity type)</td>
<td>a Delaware corporation</td>
</tr>
<tr>
<td>SIGNATURE:</td>
<td>SIGNATURE:</td>
</tr>
<tr>
<td>NAME:</td>
<td>NAME:</td>
</tr>
<tr>
<td>TITLE:</td>
<td>TITLE:</td>
</tr>
<tr>
<td>DATE:</td>
<td>EXECUTION DATE:</td>
</tr>
<tr>
<td></td>
<td>DATE OF RECEIPT (EFFECTIVE DATE):</td>
</tr>
</tbody>
</table>
### SECTION A

**PRODUCT DESCRIPTIONS, PRICES AND PAYMENT TERMS**

**BILL TO**
Milwaukee County, WI  
Kevin Bruhn, Land Information Officer  
633 W Wisconsin Ave  
Suite 903  
Milwaukee, WI 53203  
(414) 278-3927  
kevin.bruhn@milwaukee countywi.gov

**SHIP TO**
Milwaukee County, WI  
Kevin Bruhn, Land Information Officer  
633 W Wisconsin Ave  
Suite 903  
Milwaukee, WI 53203  
(414) 278-3927  
kevin.bruhn@milwaukee countywi.gov

<table>
<thead>
<tr>
<th>QTY</th>
<th>PRODUCT NAME</th>
<th>PRODUCT DESCRIPTION</th>
<th>LIST PRICE</th>
<th>DISCOUNT PRICE (%)</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>261</td>
<td>AccuPLUS 3in - PICT DTM - Per Sector</td>
<td>Product includes 3-inch GSD AccuPlus ortho mosaic tiles (GeoTIFF format, 3-inch GSD oblique frame images 4-way), 3-inch GSD orthogonal frame images, 3-inch GSD area-wide ortho mosaic (ECW format), 1-meter GSD ortho mosaic sector tiles and one area-wide 1-meter GSD mosaic (ECW format). Orthogonal GSD: 0.25 feet/pixel, Nominal Oblique GSD (all values +/−10%): Front Line 0.24 feet/pixel, Middle Line 0.28 feet/pixel, Back Line 0.34 feet/pixel. Orto-mosaic accuracy: 1.00 ft. RMSE (X or Y); 2.49 ft. NSRDA 95%; meets or exceeds NMAS &amp; ASPRS Class 1 at 1&quot;=1'0&quot;. Refer to attached terms and conditions. Applicable Terms and Conditions - Delivered Content Terms and Conditions of Use.</td>
<td>$695.00</td>
<td>$626.00 (24.317%)</td>
<td>$137,286.00</td>
</tr>
<tr>
<td>1</td>
<td>RapidAccess - Disaster Response Program</td>
<td>RapidAccess - Disaster Response Program is an emergency response program offering flights after an emergency or disaster. Refer to the attached detailed description of the Disaster Response Program. Applicable Terms and Conditions - Order Form.</td>
<td>$0.00</td>
<td>$0.00 (100%)</td>
<td>$0.00</td>
</tr>
<tr>
<td>1</td>
<td>AccuPLUS Project Fee - PICT DTM</td>
<td>AccuPLUS project fee for projects without customer-supplied DTM. Applicable Terms and Conditions - Delivered Content Terms and Conditions of Use.</td>
<td>$7,500.00</td>
<td>$0.00 (100%)</td>
<td>$0.00</td>
</tr>
<tr>
<td>3</td>
<td>Pictometry Connect View - CA</td>
<td>Pictometry Connect View - CA (Custom Access) provides visualization-only access to the Pictometry-hosted custom imagery libraries specified elsewhere in this Agreement via a web application or server based integration. Requires a customer-provided web application or server based application. With respect to imagery available through this product to third parties or the Public. Pictometry reserves the right to reduce the resolution of the imagery available. Term commences on date of activation. The quantity represents the number of years in the Connect term. Applicable Terms and Conditions - Web Visualization Offering Terms and Conditions.</td>
<td>$2,250.00</td>
<td>$0.00 (100%)</td>
<td>$0.00</td>
</tr>
<tr>
<td>1</td>
<td>AccuPlus Imagery Bundle with Three (3) Years of EFS Maintenance &amp; Support</td>
<td>Includes digital copy of the Licensed Documentation for the License Software, two (2) End User Training Sessions, one (1) Advanced User Technical Training, one (1) Administration / IT Training Session, fifteen (15) hours of telephone support, one copy of Pictometry Electronic Field Study (EFS) software, latest version, on the storage media specified herein, and access to download updated versions of the EFS Licensed Software for a period of three years from the initial date of shipment of the EFS software, along with a copy of the updated documentation. Applicable Terms and Conditions - Software License Agreement.</td>
<td>$0.00</td>
<td>$0.00 (100%)</td>
<td>$0.00</td>
</tr>
<tr>
<td>1</td>
<td>Media Drive Capacity 951G - Drive Model 1T - EXTPOWER</td>
<td>External USB 2.0 / eSATA Externally Powered. Delivery media prices include copying a complete image library.</td>
<td>$199.00</td>
<td>$0.00 (100%)</td>
<td>$0.00</td>
</tr>
<tr>
<td>QTY</td>
<td>PRODUCT NAME</td>
<td>PRODUCT DESCRIPTION</td>
<td>LIST PRICE</td>
<td>DISCOUNT PRICE (%)</td>
<td>AMOUNT</td>
</tr>
<tr>
<td>-----</td>
<td>--------------</td>
<td>---------------------</td>
<td>------------</td>
<td>-------------------</td>
<td>--------</td>
</tr>
<tr>
<td>3</td>
<td>Pictometry Connect - CA - 100</td>
<td>Pictometry Connect - CA - 100 (Custom Access) provides up to 100 concurrent authorized users the ability to log in and access the Pictometry-hosted custom imagery libraries specified elsewhere in this Agreement via a web-based, server-based or desktop integration. The default deployment is through web-based Pictometry Connect. Term commences on date of activation. The quantity represents the number of years in the Connect term. Applicable Terms and Conditions: Online Services General Terms and Conditions, Software License Agreement.</td>
<td>$9,900.00</td>
<td>(100%)</td>
<td>$0.00</td>
</tr>
</tbody>
</table>

Thank you for choosing Pictometry as your service provider.  

TOTAL $137,286.00

Amount per product = ((1-Discount %) * Qty * List Price)

FEES; PAYMENT TERMS

All amounts due to Pictometry pursuant to this Agreement ("Fees") are expressed in United States dollars and do not include any duties, taxes (including, without limitation, any sales, use, ad valorem or withholding, value added or other taxes) or handling fees, all of which are in addition to the amounts shown above and, to the extent applicable to purchases by Customer, shall be paid by Customer to Pictometry without reducing any amount owed to Pictometry unless documents satisfactory to Pictometry evidencing exemption from such taxes is provided to Pictometry prior to billing. To the extent any amounts properly invoiced pursuant to this Agreement are not paid within thirty (30) days following the invoice due date, such unpaid amounts shall accrue, and Customer shall pay, interest at the rate of 1.5% per month (or at the maximum rate allowed by law, if less). In addition, Customer shall pay Pictometry all costs Pictometry incurs in collecting past due amounts due under this Agreement including, but not limited to, attorneys' fees and court costs.

Due at Signing $11,440.50
Due at Initial Shipment of Imagery $34,321.50
Due at First Anniversary of Shipment of Imagery $45,762.00
Due at Second Anniversary of Shipment of Imagery $45,762.00

Total Payments $137,286.00

PRODUCT PARAMETERS

ACCUPPLUS IMAGERY
Product: AccuPLUS 3in - PICT DTM - Per Sector
Coverage Area Format: Shapefile
Leaf: Leaf Off. Less than 30% leaf cover

CONNECT
Product: Pictometry Connect View - CA
Admin User Name: Kevin Bruhn
Admin Email: kevin.bruhn@milwaukeecounty.wi.gov
Geofence: WI Milwaukee

Product: Pictometry Connect - CA - 100
Admin User Name: Kevin Bruhn
Admin Email: kevin.bruhn@milwaukeecounty.wi.gov
Geofence: WI Milwaukee

RapidAccess—Disaster Response Program ("DRP")
Customer is eligible for DRP described below from the Effective Date through the second anniversary of the initial Project delivery. Following payment to Pictometry of amounts due with respect to each subsequent Project, Customer will be eligible for the then-current DRP for a period of two years from delivery of such subsequent Project. Customer must be in good-standing with Pictometry to maintain eligibility for DRP.
A. Disaster Coverage Imagery at No Additional Charge – Pictometry will, upon request of Customer and at no additional charge, provide standard quality imagery of up to 200 square miles of affected areas (as determined by Pictometry) upon the occurrence of any of the following events during any period Customer is eligible for DRP:

- Hurricane: areas affected by hurricanes of Category 2 and higher.
- Tornado: areas affected by tornadoes rated EF4 and higher.
- Terrorist: areas affected by damage from terrorist attack.
- Earthquake: areas affected by damage to critical infrastructure resulting from earthquakes measured at 6.0 or higher on the Richter scale.
- Tsunami: areas affected by damage to critical infrastructure resulting from tsunamis.

B. Discounted Rate – Coverage for areas affected by the events set forth above exceeding 200 square miles will be, subject to Pictometry resource availability, offered to Customer at the then current DRP rates. Also, coverage for areas affected by hurricanes below Category II, tornadoes below EF4 or earthquakes rated below 6.0 on the Richter scale will be, subject to Pictometry resource availability, offered to Customer at the then current DRP rates.

C. Online Services – Use of Pictometry Connect Explorer™ – Pictometry’s DRP includes the use of Connect Explorer for a term of ninety days from the date of delivery of the DRP imagery. Customer shall have access to the DRP imagery for as long as they maintain an active Connect account.
SECTION B

PICTOMETRY DELIVERED CONTENT
TERMS AND CONDITIONS OF USE

These Pictometry Delivered Content Terms and Conditions of Use (the "Delivered Content Terms and Conditions"), in combination with the corresponding Agreement into which these terms are incorporated, collectively set forth the terms and conditions that govern use of Delivered Content (as hereinafter defined) for use within computing environments operated by parties other than Pictometry. As used in the Delivered Content Terms and Conditions, the terms "you" and "your" in uppercase or lowercase shall mean the Customer that entered into the Agreement into which the Delivered Content Terms and Conditions are incorporated.

1. DEFINITIONS

1.1 "Authorized Subdivision" means, if you are a county or a non-state consortium of counties, any political unit or subdivision located totally or substantially within your boundaries that you authorize to have access to Delivered Content pursuant to the Delivered Content Terms and Conditions.

1.2 "Authorized System" means a workstation or server that meets each of the following criteria: (i) it is owned or leased by you or an Authorized Subdivision; (ii) it is located within and only accessible from facilities that are owned or leased by you or an Authorized Subdivision; and (iii) it is under the control of and may only be used by you or Authorized Subdivisions.

1.3 "Authorized User" means any employee of you or Authorized Subdivisions that is authorized by you to have access to the Delivered Content through an Authorized System.

1.4 "Delivered Content" means the images, metadata, data layers, models, reports and other geographic or structural visualizations or embodiments included in, provided with, or derived from the information delivered to you by or on behalf of Pictometry pursuant to the Agreement.

1.5 "Project Participant" means any employee or contractor of persons or entities performing services for compensation for you or an Authorized Subdivision that has been identified by written notice to Pictometry prior to being granted access to Delivered Content and, unless Pictometry expressly waives such requirement for any individual, has entered into a written agreement with Pictometry authorizing such access.

2. GRANT OF RIGHTS; RESTRICTIONS ON USE; OWNERSHIP

2.1 Subject to the terms and conditions of the Agreement, you are granted nonexclusive, nontransferable, limited rights to:

(a) install the Delivered Content on Authorized Systems;

(b) permit access and use of the Delivered Content through Authorized Systems by

(i) Authorized Users for performance of public responsibilities of you or Authorized Subdivisions that are to be performed entirely within facilities of you or Authorized Subdivisions;

(ii) Project Participants under the supervision of Authorized Users for performance of tasks or preparation of materials using only hard copies (or jpeg copies) of Delivered Content solely for fulfilling public responsibilities of you or Authorized Subdivisions to be performed entirely within facilities of you or Authorized Subdivisions, and

(iii) individual members of the public, but only through Authorized Users and solely for the purpose of making hard copies or jpeg copies of images of individual properties or structures (but not bulk orders of multiple properties or structures) to the individual members of the public requesting them.

2.2 You may not reproduce, distribute or make derivative works based upon the Delivered Content in any medium, except as expressly permitted in the Delivered Content Terms and Conditions.

2.3 You may not offer any part of the Delivered Content for commercial resale or commercial redistribution in any medium.

2.4 You may not distribute or otherwise make available any Delivered Content to Google or its affiliates, either directly or indirectly.

2.5 You may not exploit the goodwill of Pictometry, including its trademarks, service marks, or logos, without the express written consent of Pictometry.

2.6 You may not remove, alter or obscure copyright notices or other notices contained in the Delivered Content.

2.7 All right, title, and interest (including all copyrights, trademarks and other intellectual property rights) in Delivered Content in all media belong to Pictometry or its third party suppliers. Neither you nor any users of the Delivered Content acquire any proprietary interest in the Delivered Content, or any copies thereof, except the limited use rights granted herein.

3. OBLIGATIONS OF CUSTOMER

3.1 Geographic Data. If available, you agree to provide to Pictometry geographic data in industry standard format (e.g., shape, DBF) including, but not limited to, digital elevation models, street centerline maps, tax parcel maps and centroids, which data, to the extent practicable, shall be incorporated into the Delivered Content. You agree that any of this data that is owned by you may be distributed and modified by Pictometry as part of its products and services, provided that at no time shall Pictometry claim ownership of that data.

3.2 Notification. You shall (a) notify Pictometry in writing of any claims or proceedings involving any of the Delivered Content within ten (10) days after you learn of the claim or proceeding, and (b) report promptly to Pictometry all claimed or suspected defects in Delivered Content.

3.3 Authorized User Compliance. You shall at all times be responsible for compliance by each Authorized User with the Delivered Content Terms and Conditions.

3.4 Authorized Subdivision Compliance. You shall at all times be responsible for compliance by each Authorized Subdivision with the Delivered Content Terms and Conditions.

3.5 Project Participants. Each notice to Pictometry identifying a potential Project Participant shall include a detailed description of the scope and nature of the Project Participants' planned work and the intended use of the Delivered Content in such work. Pictometry retains the right to restrict or revoke access to Delivered Content by any Project Participant who does not comply with the terms of the Delivered Content Terms and Conditions.

4. LICENSE DURATION; EFFECT OF TERMINATION

4.1 Term. The license granted to you in the Delivered Content Terms and Conditions is perpetual, subject to Pictometry's right to terminate the license in the event you do not pay in full the Fees specified elsewhere in the Agreement, the Agreement is terminated for any reason other than a breach of the Agreement by Pictometry, or as otherwise provided in the Agreement.

4.2 Effect of Termination. Upon termination of the license granted to you in the Delivered Content Terms and Conditions, you shall immediately cease all use of the Delivered Content, promptly purge all copies of the Delivered Content from all workstations and servers on which any of it may be stored or available at the time, and return hard drive/media containing Delivered Content to Pictometry.

5. TRADEMARKS; CONFIDENTIALITY

5.1 Use of Pictometry's Marks. You agree not to attach any additional trademarks, trade names, logos or designations to any Delivered Content or to any copies thereof.
of any Delivered Content without prior written approval from Pictometry. You may, however, include an appropriate government seal and your contact information so long as the seal and contact information in no way obscure or deface the Pictometry marks. You further agree that you will not use any Pictometry trademark, trade name, logo, or designation in connection with any product or service other than the Delivered Content. Your nonexclusive right to use Pictometry’s trademarks, trade names, logos, and designations are coterminous with the license granted to you in the Delivered Content Terms.

5.2 Confidentiality of Delivered Content. The Delivered Content consists of commercially valuable, proprietary products owned by Pictometry, the design and development of which reflect an investment of considerable time, effort, and money. The Delivered Content is treated by Pictometry as confidential and contains substantial trade secrets of Pictometry. You agree that you will not disclose, provide a copy of, or disseminate the Delivered Content (other than as expressly permitted in the Delivered Content Terms and Conditions) or any part thereof to any person in any manner or for any purpose inconsistent with the license granted to you in the Delivered Content Terms and Conditions. You agree to use your best efforts to assure that your personnel, and any others afforded access to the Delivered Content, protect the Delivered Content against unauthorized use, disclosure, copying, and dissemination, and that access to the Delivered Content and each part thereof will be strictly limited.

6. LIMITED WARRANTY; DISCLAIMER OF WARRANTIES

6.1 Limited Warranties: Exclusive Remedy. Pictometry warrants that the Delivered Content will contain true and usable copies of the designated imagery as of the date of capture. As the sole and exclusive remedy for any breach of the foregoing warranty, Pictometry shall use reasonable efforts to correct any deficiency that precludes use of the Delivered Content in the manner intended.

6.2 Disclaimer of Other Warranties. Except as provided in Section 6.1, above, THE DELIVERED CONTENT IS PROVIDED TO YOU “AS IS” AND “WITH ALL FAULTS.” PICTOMETRY MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND, EXPRESS, IMPLIED, OR STATUTORY. ALL IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO WARRANTIES OF PERFORMANCE, MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, AND ACCURACY, ARE HEREBY DISCLAIMED AND EXCLUDED BY PICTOMETRY.

6.3 Limitation of Liability. With respect to any other claims that you may have or assert against Pictometry on any matter relating to the Delivered Content, the total liability of Pictometry shall, in the aggregate, be limited to the aggregate amount received by Pictometry in payment for Delivered Content during the immediately preceding twenty-four (24) month period.

7. MISCELLANEOUS PROVISIONS

7.1 Restricted Rights. Delivered Content acquired with United States Government funds or intended for use within or for any United States federal agency is provided with "Restricted Rights" as defined in DFARS 252.227-7013, Rights in Technical Data and Computer Software and FAR 52.227-14, Rights in Data-General, including; Alternate III, as applicable.

7.2 Governing Law. This License Agreement shall be governed by and interpreted in accordance with the laws of the State of New York, excluding its conflicts of law principles.

[END OF DELIVERED CONTENT TERMS AND CONDITIONS]
SECTION B  PICTOMETRY ONLINE SERVICES

LICENSE TERMS

GENERAL TERMS AND CONDITIONS

These Pictometry Online Services General Terms and Conditions (the “General Terms and Conditions”), in combination with the corresponding Pictometry order form, if any, collectively constitute the license agreement (the “License Agreement”) that governs your use of the Pictometry online services (the “Online Services”), the images available through the Online Services, and all associated metadata and data layers included in, provided with, or derived from these images (the “Licensed Content”) provided by Pictometry International Corp. and its affiliated companies (collectively, “Pictometry”). The terms “you” and “your” in uppercase or lowercase shall mean the individual, entity (e.g., corporation, limited liability company, partnership, sole proprietor, etc.) or government agency entering into the License Agreement

1. GRANT OF RIGHTS; RESTRICTIONS ON USE; OWNERSHIP

1.1 You are granted a nonexclusive, nontransferable, limited right to access and use the Online Services and the Licensed Content obtained or derived from the Online Services solely for your internal business purposes and not for resale or redistribution. The rights granted to you include, subject to the restrictions set forth below and on the Order Form, the right to copy limited portions of the Licensed Content onto your computer to facilitate preparation of hardcopies and work product records. and the right to make hardcopies of the Licensed Content, provided that the Licensed Content and the permitted copies thereof may not be sold, leased, loaned, distributed, or copied for use by anyone other than you.

1.2 You may not make the Online Services available to any other party.

1.3 You may not copy the Licensed Content or portions thereof onto any computer or storage device or media for the purpose of creating or maintaining one or more databases of that content for use in substitution for subsequent access to the content through the Online Services.

1.4 You may not distribute or otherwise make available any Licensed Content to Google or its affiliates, either directly or indirectly. You may not exploit the goodwill of Pictometry, including its trademarks, service marks, or logos, without the express written consent of Pictometry.

1.5 You may not remove, alter or obscure copyright notices or other notices contained in the Licensed Content.

1.6 You may not offer any part of the Online Services or the Licensed Content for commercial resale or commercial redistribution in any medium.

1.7 You may not use the Online Services or the Licensed Content to compete with any businesses of Pictometry.

1.8 You may not use information included in the Online Services or the Licensed Content to determine an individual consumer’s eligibility for (a) credit or insurance for personal, family, or household purposes, (b) employment, or (c) a government license or benefit. The term “consumer” is defined in the United States Fair Credit Reporting Act at 15 USC §1681.

1.9 You may not access the Online Services via mechanical, programmatic, robotic, scripted or any other automated means unless otherwise agreed by Pictometry in writing, use of the Online Services is permitted only via manually conducted, discrete, human-initiated individual search and retrieval activities.

1.10 All rights, title, and interest (including all copyrights, trademarks and other intellectual property rights) in the Online Services and the Licensed Content in all media belong to Pictometry or its third party suppliers. Neither you nor any users of the Online Services or the Licensed Content acquire any proprietary interest in the Online Services, the Licensed Content, or any copies thereof, except the limited use rights granted herein.

2. ACCESS TO SERVICES

2.1 Only you, your employees, and temporary or contract employees dedicated to performing work exclusively for you (each, an “Eligible User” and collectively, the “Eligible Users”) are eligible to access and use the Online Services and the Licensed Content pursuant to the License Agreement. Each Eligible User to be provided access to the Online Service shall be assigned a unique login/password (“Pictometry Credential”) for purposes of accessing the Online Services. You agree that each Pictometry Credential shall only be used by the Eligible User to whom it was originally assigned and that Pictometry Credentials may not be shared with or used by any other person, including other Eligible Users. You will promptly deactivate an Eligible User’s Pictometry Credential in the event the Eligible User no longer meets the eligibility requirements or you otherwise wish to terminate the Eligible User’s access to the Online Services. You are responsible for all use of the Online Services accessed with Pictometry Credentials issued to your Eligible Users, including associated charges, whether by Eligible Users or others. You will use reasonable commercial efforts to prevent unauthorized use of Pictometry Credentials assigned to your Eligible Users and will promptly deactivate any Pictometry Credentials you suspect are lost, stolen, compromised or misused.

2.2 The Online Services, the Licensed Content, and features and functionality within the Online Services may be enhanced, added to, withdrawn, or otherwise changed by Pictometry without notice.

2.3 You are aware and understand that any user data collected or stored by the Online Services may be accessed by US law enforcement agencies under the US PATRIOT Act. You hereby release, and agree to hold Pictometry harmless from, all claims against Pictometry with respect to such access.

3. DISCLAIMERS

3.1 The Online Services and the Licensed Content are provided for visualization purposes only, are not authoritative or definitive, and do not constitute professional engineering or surveying services.

3.2 The Online Services and the Licensed Content are not to be relied upon to precisely locate or determine property boundaries and should not be used in lieu of a professional survey where the accuracy of measurements, distance, height, angle, area and volume, may have significant consequences.

3.3 All measurements and reports generated by the Online Services or from the Licensed Content are based upon second order visualization and measurement data that do not provide authoritative or definitive measurement results suitable for professional engineering or surveying purposes.

3.4 Contour information obtained from the Online Services or contained in the Licensed Content is generated from undersampled elevation data, is provided for informational purposes only, and is not suitable for use as the basis for hydrographic computations, estimations or analyses.

3.5 While the Online Services and the Licensed Content may be considered useful supplements for life critical applications, they are not designed or maintained to support such applications and Pictometry and its third party suppliers of the Online Services and the Licensed Content hereby disclaim all liability for damages claims and expenses arising from such use.

3.6 Your reliance on the Online Services and the Licensed Content should only be undertaken after an independent review of their accuracy, completeness, efficacy, timeliness and adequacy for your intended purpose.

3.7 Pictometry and each third party supplier of any portion of the Online Services or the Licensed Content assume no responsibility for any consequences resulting from the use of the Online Services or the Licensed Content.

3.8 Pictometry and each third party supplier of any portion of the Online Services or the Licensed Content hereby disclaim all liability for damages, claims and expenses arising from or in any way related to the accuracy or availability of the Online Services and the Licensed Content.

3.9 By accessing these General Terms and Conditions or by using the Online Services or the Licensed Content, you waive any and all rights you may have against Pictometry, each third party supplier of any portion of the Online Services or the Licensed Content, and each of their directors, officers, members and employees, arising out of use or reliance upon the Online Services or the Licensed Content.

4. LIMITED WARRANTY

Page 8 of 17  Milwaukee County, WI – C11617576 2019-04-25  DD-0001-20160318
5. LIMITATION OF LIABILITY

5.1 No Covered Party (as defined below) shall be liable for any loss, injury, claim, liability, or damage of any kind resulting in any way from (a) any errors in or omissions from the Online Services or the Licensed Content, (b) the unavailability or interruption of the Online Services or any features thereof or the Licensed Content, (c) your or an Eligible User’s use of the Online Services or the Licensed Content, (d) the loss or corruption of any data or equipment in connection with the Online Services or the Licensed Content, (e) the content, accuracy, or completeness of the Licensed Content, all regardless of whether you received assistance in the use of the Online Service from a Covered Party, (f) any delay or failure in performance beyond the reasonable control of a Covered Party, or (g) any content retrieved from the Internet even if retrieved or linked to from within the Online Services.

5.2 "Covered Party" means (a) Pictometry and any officer, director, employee, subcontractor, agent, successor, or assign of Pictometry, and (b) each third party supplier of any Licensed Content, third party alliance entity, their affiliates, and any officer, director, employee, subcontractor, agent, successor, or assign of any third party supplier of any Licensed Content or third party alliance entity and their affiliates.

5.3 TO THE FULLEST EXTENT PERMISSIBLE BY APPLICABLE LAW, UNDER NO CIRCUMSTANCES WILL THE AGGREGATE LIABILITY OF THE COVERED PARTIES IN CONNECTION WITH ANY CLAIM ARISING OUT OF OR RELATING TO THE ONLINE SERVICES OR THE LICENSED CONTENT OR THIS LICENSE AGREEMENT EXCEED THE LESSER OF YOUR ACTUAL DIRECT DAMAGES OR THE AMOUNT YOU PAID FOR THE ONLINE SERVICES IN THE TWELVE MONTH PERIOD IMMEDIATELY PRECEDING THE DATE THE CLAIM AROSE. YOUR RIGHT TO MONETARY DAMAGES IN THAT AMOUNT SHALL BE IN LIEU OF ALL OTHER REMEDIES WHICH YOU MAY HAVE AGAINST ANY COVERED PARTY.

5.4 TO THE FULLEST EXTENT PERMISSIBLE IN APPLICABLE LAW, NEITHER YOU NOR THE COVERED PARTIES WILL BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES OF ANY KIND WHATSOEVER (INCLUDING, WITHOUT LIMITATION, ATTORNEYS' FEES) IN ANY WAY DUE TO, RESULTING FROM, OR ARISING IN CONNECTION WITH THE ONLINE SERVICES, THE LICENSED CONTENT, OR THE FAILURE OF ANY COVERED PARTY TO PERFORM ITS OBLIGATIONS. THE FOREGOING LIMITATION OF LIABILITY SHALL NOT APPLY TO A PARTY'S INDEMNITY OBLIGATIONS OR YOUR (AND YOUR ELIGIBLE USERS') INFRINGEMENT OF INTELLECTUAL PROPERTY OR MISAPPROPRIATION OF PROPRIETARY DATA BELONGING TO PICTOMETRY OR ITS THIRD PARTY SUPPLIERS.

5.5 Notwithstanding anything to the contrary in this Section 5:
(a) If there is a breach of the warranty in Section 4.1 above, then Pictometry, at its option and expense, shall either defend or settle any action and hold you harmless against proceedings or damages of any kind or description based on a third party’s claim of patent, trademark, service mark, copyright or trade secret infringement related to use of the Online Services or the Licensed Content, asserted against you by such third party provided (i) all use of the Online Services and the Licensed Content was in accordance with this License Agreement, (ii) the claim, cause of action or infringement was not caused by you modifying or combining the Online Services or the Licensed Content with or into other products, applications, images or data not approved by Pictometry, (iii) you give Pictometry prompt notice of such claim, and (iv) you give Pictometry the right to control and direct the investigation, defense and settlement of such claim. You, at Pictometry’s expense, shall reasonably cooperate with Pictometry in connection with the foregoing.
(b) In addition to Section 5.5(a), if the Online Services, the operation thereof or the Licensed Content become, or in the opinion of Pictometry are likely to become, the subject of a claim of infringement, Pictometry may, at its option and expense, either (i) procure for you the right to continue using the Online Services or the Licensed Content, (ii) replace or modify the Online Services or the Licensed Content so that they become non-infringing, or (iii) terminate the License Agreement on notice to you and grant you a pro-rata refund or credit (whichever is applicable) for any pre-paid fees or fixed charges.
(c) The provisions of Sections 5.5(a) and (b) shall constitute your sole and exclusive remedy for the respective matters specified therein.

6. MISCELLANEOUS

6.1 The terms and conditions of this License Agreement may be changed from time to time immediately upon notice to you. If any changes are made to this License Agreement, such changes will: (a) only be applied prospectively, and (b) not be specifically directed against you or your Eligible Users but will apply to all similarly situated Pictometry customers using the Online Services. You may terminate this License Agreement upon written notice to Pictometry if any change to the terms and conditions of this License Agreement is unacceptable to you. For termination to be effective under this Section 6.1, written notice of termination must be provided to Pictometry within 90 days of the effective date of the change. Continued use of the Online Services following the effective date of any change constitutes acceptance of the change, but does not affect the foregoing termination right. Except as provided above, this License Agreement may not be supplemented, modified or otherwise revised unless signed by duly authorized representatives of both parties. Furthermore, this License Agreement may not be supplemented, modified or otherwise revised by email exchange, even if the email contains a printed name or signature line bearing signature-like font. The foregoing does not prohibit the execution of electronic contracts bearing electronic signatures of authorized representatives of both parties, provided such signatures include digital certifications or are otherwise authenticated.

6.2 In the event of a breach of this License Agreement by you, any Eligible User or someone using the Pictometry Credential of an Eligible User, Pictometry may temporarily suspend or discontinue providing access to the Online Services to any or all Eligible Users without notice and Pictometry may pursue any other legal remedies available to it.

6.3 All notices and other communications hereunder shall be in writing or displayed electronically in the Online Services by Pictometry. Notices shall be deemed to have been properly given on the date deposited in the mail, if mailed; on the date first made available, if displayed in the Online Services; or on the date received, if delivered in any other manner. Legal notices to Pictometry should be sent to Pictometry, Attn: General Counsel, 25 Methodist Hill Drive, Suite 140, New York, New York 14623.

6.4 The failure of, Pictometry, or any third party supplier of the Online Services or any Licensed Content to enforce any provision hereof shall not constitute or be construed as a waiver of such provision or of the right to enforce it at a later time.

6.5 Neither you nor any Eligible User may assign or otherwise transfer your rights or delegate your duties under this License Agreement without the prior written consent of Pictometry. Any attempt by you or any Eligible User to assign, transfer or delegate your rights or obligations under this License Agreement without Pictometry’s consent shall be void, and shall also void the limited license granted to you by this License Agreement. This License Agreement may not be assigned or transferred by Pictometry or its Affiliates without your prior written consent, except as permitted herein.

6.6 This License Agreement shall be governed by and interpreted in accordance with the laws of the State of New York, excluding its conflicts of law principles. If you are a government entity, in the event that any legal proceedings are commenced with respect to any matter arising under this License Agreement, the parties specifically consent and agree that the courts of the State of New York or, in the alternative, the Federal Courts located in the State of New York.
shall have exclusive jurisdiction over each of the parties and over the subject matter of any such proceedings, and that the venue of any such action shall be in Monroe County, New York or the U.S. District Court for the Western District of New York, as applicable.

6.7 This License Agreement will be enforced to the fullest extent permitted by applicable law. If any provision of this License Agreement is held to be invalid or unenforceable to any extent, then (a) such provision will be interpreted, construed and reformed to the extent reasonably required to render it valid, enforceable and consistent with its original intent and (b) such invalidity or unenforceability will not affect any other provision of this License Agreement.

6.8 Where applicable, each affiliated company of Pictometry and each third party supplier of the Online Services or any Licensed Content has the right to assert and enforce the provisions of this License Agreement directly on its own behalf as a third party beneficiary.

6.9 In the event of a breach of your obligations under this License Agreement or your payment obligations with respect to access to the Online Services or the Licensed Content, you agree to pay all of Pictometry's costs of enforcement and collection, including court costs and reasonable attorneys' fees.

6.10 This License Agreement constitutes the entire agreement of the parties with respect to its subject matter and replaces and supersedes any prior written or verbal communications, representations, proposals or quotations relating to that subject matter.

[END OF ONLINE SERVICES GENERAL TERMS AND CONDITIONS]
SECTION B  

PICTOMETRY WEB VISUALIZATION OFFERING
TERMS AND CONDITIONS

These Pictometry Web Visualization Offering Terms and Conditions (the "WVO Terms and Conditions"), in combination with the corresponding Pictometry order form, if any, collectively constitute the license agreement (the "WVO License Agreement") that governs your use of Pictometry web visualization offerings (the "WVO Services"), unless otherwise provided in the WVO Services, and all associated metadata and data layers included in, provided with, or derived from these images (the "WVO Licensed Content") provided by Pictometry International Corp. and its affiliated companies (collectively, "Pictometry"). The terms "you" and "your" in uppercase or lowercase shall mean the individual, entity (e.g., corporation, limited liability company, partnership, sole proprietor, etc.) or government agency entering into the WVO License Agreement.

1. GRANT OF RIGHTS; RESTRICTIONS ON USE; OWNERSHIP

1.1 You are granted a nonexclusive, nontransferable, limited right to use and to provide public access to, and use of, the WVO Services solely for purposes of providing access to WVO Licensed Content in response to human-initiated, discrete location-specific requests through a single web site operated exclusively by or for you to serve you and your public constituencies and not for resale or redistribution or commercial use of any nature.

1.2 You may not copy or retain copies of the WVO Licensed Content obtained through the WVO Services or portions thereof onto any computer or storage device or media for the purpose of creating or maintaining one or more databases of that content for use in substitution for subsequent access to the content through the WVO Services or any other Pictometry Services, nor will you authorize or permit any user of the WVO Services to do so.

1.3 You may not exploit the goodwill of Pictometry, including its trademarks, service marks, or logos without the express written consent of Pictometry.

1.4 You may not remove, alter or obscure copyright notices or other notices contained in the WVO Licensed Content.

1.5 You may not offer any part of the WVO Services or the WVO Licensed Content for commercial resale or commercial redistribution in any medium.

1.6 All right, title, and interest (including all copyrights, trademarks and other intellectual property rights) in the WVO Services and the WVO Licensed Content in all media belong to Pictometry or its third party suppliers. Neither you nor any users of the WVO Services or the WVO Licensed Content acquire any proprietary interest in the WVO Services, the WVO Licensed Content, or any copies thereof, except the limited use rights granted herein.

2. TERMS OF ACCESS TO WVO SERVICES

2.1 You shall provide to all end-users of the WVO Services on the page through which they access such services conspicuous notice of the following terms of access: (a) WVO Licensed Content available through the WVO is copyrighted material, (b) end-users of the WVO Services are granted the right to access and view the WVO Licensed Content through the WVO Services for personal use only and not for commercial purposes of any type, (c) end-users of the WVO Services are prohibited from reproducing, redistributing or creating derivative works from WVO Licensed Content. (d) all right, title, and interest (including all copyrights, trademarks and other intellectual property rights) in the WVO Services and the WVO Licensed Content in all media belong to Pictometry or its third party suppliers. and (e) THE WVO SERVICES AND WVO LICENSED CONTENT ARE PROVIDED ON AN "AS IS", "AS AVAILABLE" BASIS AND PICTOMETRY AND EACH THIRD PARTY SUPPLIER OF WVO LICENSED CONTENT EXPRESSLY DISCLAIM ALL OTHER WARRANTIES, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

2.2 The WVO Services, the WVO Licensed Content, and features and functionality within the WVO Services may be enhanced, added to, withdrawn, or otherwise changed by Pictometry without notice.

2.3 You are aware and understand that any user data collected or stored by the WVO Services may be accessed by US law enforcement agencies under the US PATRIOT Act. You hereby release, and agree to hold Pictometry harmless from, all claims against Pictometry with respect to such access.

3. DISCLAIMERS

3.1 The WVO Services and the WVO Licensed Content are provided for visualization purposes only, are not authoritative or definitive, and do not constitute professional engineering or surveying services.

3.2 The WVO Services and the WVO Licensed Content are not to be relied upon to precisely locate or determine property boundaries and should not be used in lieu of a professional survey where the accuracy of measurements, distance, height, angle, area and volume, may have significant consequences.

3.3 All measurements and reports generated by the WVO Services or from the WVO Licensed Content are based upon second order visualization and measurement data that do not provide authoritative or definitive measurement results suitable for professional engineering or surveying purposes.

3.4 Contour information obtained from the WVO Services or contained in the WVO Licensed Content is generated from undersampled elevation data, is provided for informational purposes only, and is not suitable for use as the basis for hydrographic computations, estimations or analyses.

3.5 While the WVO Services and the WVO Licensed Content may be considered useful supplements for life critical applications, they are not designed or maintained to support such applications and Pictometry and its third party suppliers of the WVO Services and the WVO Licensed Content hereby disclaim all liability for damages, claims and expenses arising from such use.

3.6 Your reliance on the WVO Services and the WVO Licensed Content should only be undertaken after an independent review of their accuracy, completeness, efficacy, timeliness and adequacy for your intended purpose.

3.7 Pictometry and each third party supplier of any portion of the WVO Services or the WVO Licensed Content assume no responsibility for any consequences resulting from the use of the WVO Services or the WVO Licensed Content.

3.8 Pictometry and each third party supplier of any portion of the WVO Services or the WVO Licensed Content hereby disclaim all liability for damages, claims and expenses arising from or in any way related to the accuracy or availability of the WVO Services and the WVO Licensed Content.

3.9 By accepting these WVO Terms and Conditions or by using the WVO Services or the WVO Licensed Content, you waive any and all rights you may have against Pictometry, each third party supplier of any portion of the WVO Services or the WVO Licensed Content, and each of their directors, officers, members and employees, arising out of use of or reliance upon the WVO Services or the WVO Licensed Content.

4. LIMITED WARRANTY

4.1 Pictometry represents and warrants that it has the right and authority to make the WVO Services and the WVO Licensed Content available to you as authorized expressly by this WVO License Agreement.

4.2 EXCEPT AS OTHERWISE PROVIDED IN SECTION 4.1, THE WVO SERVICES AND WVO LICENSED CONTENT ARE PROVIDED ON AN "AS IS", "AS AVAILABLE" BASIS AND PICTOMETRY AND EACH THIRD PARTY SUPPLIER OF WVO LICENSED CONTENT EXPRESSLY DISCLAIM ALL OTHER WARRANTIES, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

5. LIMITATION OF LIABILITY

5.1 No Covered Party (as defined below) shall be liable for any loss, injury, claim, liability, or damage of any kind resulting in any way from (a) any errors in or omissions from the WVO Services or the WVO Licensed Content, (b) the unavailability or interruption of the WVO Services or any features thereof or the WVO Licensed Content, (c) your or any other party's use of the WVO Services or the WVO Licensed Content, (d) the loss or corruption of any data or equipment in connection with the WVO Services or the WVO Licensed Content, (e) the content, accuracy, or completeness of the WVO Licensed Content,
all regardless of any assistance received in the use of the WVO Service from a Covered Party. (f) any delay or failure in performance beyond the reasonable control of a Covered Party, or (g) any content retrieved from the Internet even if retrieved or linked to from within the WVO Services. "Covered Party" means (a) Pictometry, its affiliates and any officer, director, employee, subcontractor, agent, successor, or assign of Pictometry or its affiliates. and (b) each third party supplier of any WVO Licensed Content, third party alliance entity, its affiliates. and any officer, director, employee, subcontractor, agent, successor, or assign of any third party supplier of any WVO Licensed Content or third party alliance entity and their affiliates.

5.3 TO THE FULLEST EXTENT PERMISSIBLE BY APPLICABLE LAW, UNDER NO CIRCUMSTANCES WILL THE AGGREGATE LIABILITY OF THE COVERED PARTIES IN CONNECTION WITH ANY CLAIM ARISING OUT OF OR RELATING TO THE WVO SERVICES OR THE WVO LICENSED CONTENT OR THIS WVO LICENSE AGREEMENT EXCEED THE LESSER OF YOUR ACTUAL DIRECT DAMAGES OR THE AMOUNT YOU PAID FOR THE WVO SERVICES IN THE TWENTY-FOUR MONTH PERIOD IMMEDIATELY PRECEDING THE DATE THE CLAIM AROSE. YOUR RIGHT TO MONETARY DAMAGES IN THAT AMOUNT SHALL BE IN LIEU OF ALL OTHER REMEDIES WHICH YOU MAY HAVE AGAINST ANY COVERED PARTY.

5.4 TO THE FULLEST EXTENT PERMISSIBLE BY APPLICABLE LAW, NEITHER YOU NOR THE COVERED PARTIES WILL BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES OF ANY KIND WHATSOEVER (INCLUDING, WITHOUT LIMITATION, ATTORNEYS' FEES) IN ANY WAY DUE TO, RESULTING FROM, OR ARISING IN CONNECTION WITH THE WVO SERVICES, THE WVO LICENSED CONTENT, OR THE FAILURE OF ANY COVERED PARTY TO PERFORM ITS OBLIGATIONS. THE FOREGOING LIMITATION OF LIABILITY SHALL NOT APPLY TO A PARTY'S INDEMNITY OBLIGATIONS OR YOUR (OR ANY OTHER WVO SERVICES USERS') INFRINGEMENT OF INTELLECTUAL PROPERTY OR MISAPPROPRIATION OF PROPRIETARY DATA BELONGING TO PICTOMETRY OR ITS THIRD PARTY SUPPLIERS.

5.5 Notwithstanding anything to the contrary in this Section 5,

(a) if there is a breach of the warranty in Section 4.1 above, then Pictometry, at its option and expense, shall either defend or settle any action and hold you harmless against proceedings or damages of any kind or description based on a third party’s claim of patent, trademark, service mark, copyright or trade secret infringement related to use of the WVO Services or the WVO Licensed Content, asserted against you by such third party provided. (i) all use of the WVO Services and the WVO Licensed Content was in accordance with this WVO License Agreement. (ii) the claim, cause of action or infringement was not caused by you modifying or combining the WVO Services with or into other products, applications, images or data not approved by Pictometry. (iii) you give Pictometry prompt notice of such claim. and (iv) you give Pictometry the right to control and direct the investigation, defense and settlement of such claim. You, at Pictometry's expense, shall reasonably cooperate with Pictometry in connection with the foregoing.

(b) in addition to Section 5.3(a), if the WVO Services, the operation thereof or the WVO Licensed Content become, or in the opinion of Pictometry are likely to become, the subject of a claim of infringement, Pictometry may, at its option and expense, either: (i) procure for you the right to continue using the WVO Services or the WVO Licensed Content, (ii) replace or modify the WVO Services or the WVO Licensed Content so that they become non-infringing, or (iii) terminate the WVO License Agreement on notice to you and grant you a pro-rata refund or credit (whichever is applicable) for any pre-paid fees or fixed charges.

(c) The provisions of Sections 5.5(a) and (b) shall constitute your sole and exclusive remedy for the respective matters specified therein.

6. MISCELLANEOUS

6.1 The terms and conditions of this WVO License Agreement may be changed from time to time immediately upon notice to you. If any changes are made to the terms of this License Agreement, such changes will (a) only be applied prospectively. and (b) not be specific to a similarly situated Pictometry customer using the WVO Services. You may terminate this WVO License Agreement upon written notice to Pictometry if any change to the terms and conditions of this WVO License Agreement is unacceptable to you. For termination to be effective under this Section 6.1, written notice of termination must be provided to Pictometry within 90 days of the effective date of the change. Continued use of the WVO Services following the effective date of any change constitutes acceptance of the change, but does not affect the foregoing termination right. Except as provided above, this WVO License Agreement may not be supplemented, modified or otherwise revised unless signed by duly authorized representatives of both parties. Furthermore, this WVO License Agreement may not be supplemented, modified or otherwise revised by email exchange, even if the email contains a printed name or signature line bearing signature-like font. The foregoing does not prohibit the execution of electronic contracts bearing electronic signatures of authorized representatives of both parties, provided such signatures include digital certifications or are otherwise authenticated.

6.2 In the event of a breach of this WVO License Agreement by you or someone using the WVO Services, Pictometry may temporarily suspend or discontinue providing access to the WVO Services without notice and Pictometry may pursue any other legal remedies available to it.

6.3 All notices and other communications hereunder shall be in writing. Notices shall be deemed to have been properly given on the date deposited in the mail, if mailed on or before the date received, or delivered in any other manner. Legal notices to Pictometry should be sent to Pictometry, Attn: General Counsel, 25 Methodist Hill Drive, Rochester, New York 14623.

6.4 The failure of you, Pictometry, or any third-party supplier of the WVO Services or any WVO Licensed Content to enforce any provision hereof shall not constitute or be construed as a waiver of such provision or of the right to enforce it at a later time.

6.5 You may not assign or otherwise transfer your rights or delegate your duties under this WVO License Agreement without the prior written consent of Pictometry. Any attempt by you to assign, transfer, or delegate your rights or obligations under this WVO License Agreement without Pictometry's consent shall be void, and shall also void the limited license granted to you by this WVO License Agreement. This WVO License Agreement and any amendment thereto shall be binding on, and inure to the benefit of the parties and their respective successors and permitted assigns.

6.6 This WVO License Agreement shall be governed by and interpreted in accordance with the laws of the State of New York, excluding its conflicts of law principles. Unless you are a government entity, in the event that any legal proceedings are commenced with respect to any matter arising under this WVO License Agreement, the parties specifically consent and agree that the courts of the State of New York or, in the alternative, the Federal Courts located in the State of New York shall have exclusive jurisdiction over each of the parties and over the subject matter of any such proceedings, and that the venue of any such action shall be in Monroe County, New York or the U.S. District Court for the Western District of New York, as applicable.

6.7 This WVO License Agreement will be enforced to the fullest extent permitted by applicable law. If any provision of this WVO License Agreement is held to be invalid or unenforceable to any extent, then (a) such provision will be interpreted, construed and reformed to the extent reasonably required to render it valid, enforceable and consistent with its original intent and (b) such invalidity or unenforceability will not affect any other provision of this WVO License Agreement.

6.8 Where applicable, each affiliated company of Pictometry and each third party supplier of the WVO Services or any WVO Licensed Content has the right to assert and enforce the provisions of this WVO License Agreement directly on its own behalf as a third party beneficiary.

6.9 In the event of a breach of your obligations under this WVO License Agreement or your payment obligations with respect to access to the WVO Services or the WVO Licensed Content, you agree to pay all of Pictometry's costs of enforcement and collection, including court costs and reasonable attorneys' fees.

6.10 This WVO License Agreement constitutes the entire agreement of the parties with respect to its subject matter and replaces and supersedes any prior written or verbal communications, representations, proposals or quotations relating to that subject matter.

[END OF WEB VISUALIZATION OFFERING TERMS AND CONDITIONS]
SECTION B

PICTOMETRY SOFTWARE
LICENSE AGREEMENT

PLEASE READ THIS SOFTWARE LICENSE AGREEMENT ("LICENSE") CAREFULLY BEFORE DOWNLOADING, INSTALLING OR USING THE SOFTWARE. BY USING THE SOFTWARE, YOU AGREE TO THE TERMS OF THIS LICENSE. IF YOU DO NOT AGREE TO THE TERMS OF THIS LICENSE, DO NOT DOWNLOAD, INSTALL OR USE THE SOFTWARE.

1. GENERAL. The software ("Pictometry Software") and any written materials that accompany the software ("Documentation") in any media or form are licensed, not sold, to you by Pictometry International Corp. ("Pictometry") for use only under the terms of this License. Pictometry reserves all rights not expressly granted to you in this License.

2. LICENSE. Subject to the terms and conditions of this License, you are granted a limited, non-transferable, terminable, non-sub licensable, non-exclusive license to install and use the Pictometry Software and the Documentation (collectively, the "Proprietary Materials") solely for internal use. Use of the functionality provided by the Pictometry Software other than for your internal use is prohibited, except with the prior written approval of Pictometry. You may make one copy of the Pictometry Software in machine-readable form for backup purposes only, provided that the backup copy must include all copyright and other proprietary notices contained in the original. You will not and will not enable others to decompile, reverse engineer, disassemble, attempt to derive the source code of, decrypt, modify, create derivative works of, or tamper with or disable any security or monitoring features within the Pictometry Software. Any attempt to do so is a violation of the rights of Pictometry and its licensors.

3. TITLE. The Proprietary Materials are confidential information of, trade secrets of, and are proprietary to Pictometry. Title to the Proprietary Materials is and will remain in Pictometry and its licensors. All applicable rights to patents, copyrights, trademarks, trade secrets, and other intellectual property rights in the Proprietary Materials are and will remain in Pictometry and its licensors. You will not assert any right, title or interest in the Proprietary Materials provided to you under this License, except for the express license granted to you hereunder. You will not remove any copyright or other proprietary notice or legend contained on or included in any Proprietary Materials and you will reproduce all such information on all copies made hereunder. You will keep the Proprietary Materials free of all claims, liens and encumbrances.

4. DISCLAIMERS OF WARRANTY. USE OF THE PICTOMETRY SOFTWARE IS AT YOUR SOLE RISK. TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, THE PICTOMETRY SOFTWARE IS PROVIDED "AS IS" WITH ALL FAULTS AND WITHOUT WARRANTY OF ANY KIND, AND PICTOMETRY HEREBY DISCLAIMS ALL WARRANTIES WITH RESPECT TO THE PICTOMETRY SOFTWARE, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND OF FITNESS FOR A PARTICULAR PURPOSE. PICTOMETRY DOES NOT WARRANT THAT THE FUNCTIONS CONTAINED IN OR PROVIDED BY THE PICTOMETRY SOFTWARE WILL MEET YOUR REQUIREMENTS, THAT THE OPERATION OF THE PICTOMETRY SOFTWARE WILL BE UNINTERRUPTED OR ERROR-FREE, OR THAT DEFECTS IN THE PROPRIETARY MATERIALS WILL BE CORRECTED.

5. LIMITATION OF LIABILITY. IN NO EVENT WILL PICTOMETRY BE LIABLE FOR ANY INCIDENTAL, SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES WHATSOEVER, INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF PROFITS, LOSS OF DATA, BUSINESS INTERRUPTION OR ANY OTHER COMMERCIAL DAMAGES OR LOSSES ARISING OUT OF OR RELATED TO YOUR USE OR INABILITY TO USE THE PICTOMETRY SOFTWARE, HOWEVER CAUSED, REGARDLESS OF THE THEORY OF LIABILITY (CONTRACT, TORT OR OTHERWISE), EVEN IF PICTOMETRY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT WILL PICTOMETRY'S TOTAL LIABILITY TO YOU FOR ALL DAMAGES (OTHER THAN AS MAY BE REQUIRED BY APPLICABLE LAW IN CASES INVOLVING PERSONAL INJURY) CAUSED BY, ARISING OUT OF OR IN ANY WAY RELATED TO THE PICTOMETRY SOFTWARE EXCEED THE AMOUNT OF FIFTY DOLLARS ($50.00). THE FOREGOING LIMITATIONS WILL APPLY EVEN IF THE ABOVE STATED REMEDY FAILS OF ITS ESSENTIAL PURPOSE.

6. TERMINATION. This License will terminate automatically without notice from Pictometry if you fail to comply with any term of this License. Upon the termination of this License, you will cease all use of the Pictometry Software and destroy all copies, full or partial, of the Proprietary Materials.

7. MISCELLANEOUS PROVISIONS.

A. Restricted Rights. Pictometry Software acquired with United States Government funds or intended for use within or for any United States federal agency is provided with "Restricted Rights" as defined in DFARS 252.227-7014, Rights in Technical Data and Computer Software and FAR 52.227-14, Rights in Data-General, including Alternate III, as applicable. Pictometry must be notified in advance of any license grants to United States federal governmental entities. The Pictometry Software is developed for general use in a variety of applications and is not developed or intended for use in any inherently dangerous applications or applications that could lead to property damage, personal injury or death. If you use the Pictometry Software in such applications, then you will be responsible for taking all appropriate fail-safe, backup, redundancy, and other measures to ensure the safe use of the Pictometry Software in such applications, including but not limited to, in any nuclear, aviation, mass transit, public safety or medical applications.

B. Foreign Trade Restrictions. The parties acknowledge that certain information, software technology, accompanying documentation and technical information may be subject to United States export control laws. You will not directly or indirectly export or re-export the Pictometry Software in violation of the Export Administration Regulations of the U.S. Department of Commerce.

C. Governing Law. This License will be governed by and interpreted in accordance with the laws of the State of New York, excluding its conflict of laws principles.

D. Assignment. You may not assign this License without Pictometry's prior written consent. Any assignment in violation of this License will be null, void and of no force and effect. For all purposes under this License, any merger, consolidation, spin-off, acquisition or change-in-control will be deemed an assignment.

E. Partial Invalidity; Survival. If any provision of this License is held invalid or unenforceable by competent authority, that provision will be construed so as to be limited or reduced to be enforceable to the maximum extent compatible with the laws as it will then appear. The total invalidity or unenforceability of any particular provision of this License will not affect its other provisions and this License will be construed in all respects as if the invalid or unenforceable provision were omitted. The provisions of this License that by their nature would survive its termination will survive indefinitely.
F. **Force Majeure.** Neither party will be liable for any costs or damages due to nonperformance under this License arising out of any cause not within the reasonable control of such party and without its fault or negligence. Neither party will be liable for any delay or failure in the performance of its obligations under this License that directly results from any failure of the other party to perform its obligations as set forth in this License.

G. **Waiver.** No waiver of a breach of any term of this License will be effective unless in writing and duly executed by the waiving party. No such waiver will constitute a waiver of any subsequent breach of the same or any other term of this License. No failure on the part of a party to exercise, and no delay in exercising any of its rights hereunder will operate as a waiver thereof, nor will any single or partial exercise by a party of any right preclude any other or future exercise thereof or the exercise of any other right. No course of dealing between the parties will be deemed effective to modify, amend or discharge any part of this License or the rights or obligations of any party hereunder.

H. **Entire Agreement; Construction.** This License contains the entire understanding of the parties with respect to the subject matter hereof and supersedes any prior or contemporaneous understandings regarding that subject matter. No amendment to or modification of this License will be binding unless in writing and signed by Pictometry. There are no representations, warranties, or obligations of any party not expressly contained herein. The headings in this License are for convenience only. They do not constitute a portion of this License and will not be used in any construction of it.

[END OF SOFTWARE LICENSE AGREEMENT]
SECTION C

NON-STANDARD TERMS AND CONDITIONS

1. **Online Services Eligible Users**: Notwithstanding anything in the Online Services General Terms and Conditions incorporated in this Agreement to the contrary, the terms 'Eligible User' and 'Eligible Users' as defined in those Online Services General Terms and Conditions shall, for the purposes of this Agreement, also include each 'Authorized User' as that term is defined in the Delivered Content Terms and Conditions of Use incorporated in this Agreement.

2. **Applicable Law**: Notwithstanding anything to the contrary set forth elsewhere in this Agreement, this Agreement and any modifications, amendments or alterations shall be interpreted, construed and enforced in all respects in accordance with the laws of the State of Wisconsin, excluding its conflicts of law principles. Each party irrevocably consents to the exclusive jurisdiction of the courts of the State of Wisconsin in connection with any action to enforce the provisions of this Agreement, to recover damages or other relief for breach or default under this Agreement, or otherwise arising under or by reason of this Agreement.

3. **Non-appropriation of Funds**: Notwithstanding anything herein to the contrary, in the event that the funds due for subsequent projects and related deliverables under the terms and conditions of this Agreement are not lawfully appropriated, the following provisions shall apply:
   a. Customer shall provide Pictometry with written documentation of non-appropriation of funds from its funding source prior to commencement of a subsequent project;
   b. This Agreement shall remain in full force and effect, however commencement of the subsequent project shall be deemed postponed until such time as funds for the subsequent project have been appropriated and all other sums due under the terms and conditions of this Agreement have been paid by Customer. In the event that the postponement exceeds eighteen months, Pictometry reserves the right to terminate any and all obligations with respect to the postponed project and all subsequent projects included in this Agreement; and
   c. If Customer, or any party authorized under the terms and conditions of this Agreement to use the licensed products set forth in Section A, is in possession of licensed products for which Pictometry has not been fully compensated in accordance with the payment terms of this Agreement, Customer or such authorized party shall immediately cease use of those licensed products, purge those licensed products from all Customer and authorized party computers, and return those licensed products to Pictometry.

4. Customer shall own the copy of the orthogonal imagery delivered to it by Pictometry pursuant to this Agreement. Customer is free to use, reproduce and redistribute copies of the orthogonal imagery so delivered in any manner without any accounting to Pictometry. Pictometry shall own those copies of the orthogonal imagery delivered pursuant to this Agreement that are in Pictometry's possession. Pictometry is free to use, reproduce and redistribute copies of the orthogonal imagery delivered pursuant to this Agreement in any manner without any accounting to Customer. Except for the copy of the orthogonal imagery delivered to Customer by Pictometry pursuant to this Agreement, all imagery (including associated metadata) and software delivered or otherwise made available to Customer pursuant to this Agreement constitute Delivered Content or Pictometry Software, as appropriate, and are and shall remain the exclusive property of Pictometry, subject to the rights of Customer to use the Delivered Content and the Pictometry Software pursuant to the licenses granted by Pictometry elsewhere in this Agreement.

[END OF NON-STANDARD TERMS AND CONDITIONS]
APPENDIX 1

PHOTOGRAMMETRIC PRODUCT SPECIFICATIONS

AccuPlus® Premium Ortho-Mosaic

Product Overview:
Seamless ortho-mosaic produced from individual frames and tiled to customer’s preferred tiling scheme.

Acquisition
Flight plans will be prepared to capture image frames with nominal 60% forward overlap and nominal 30% side lap in order to provide sufficient overlap for automatic aerial triangulation and mitigation of building lean in orthophotography produced. Source imagery will be acquired during times of optimal environmental conditions. Imagery will generally be captured when solar altitude is 30 degrees or greater and/or by using the most optimal four-hour window, except where capture season offers significantly longer window. Imagery will be acquired with ground free of snow cover and deciduous vegetation less than 30% of full bloom. Frames with clouds will be rejected and reflowed. Any planned deviation from these conditions imposed by capture window constraints will be discussed with client prior to commencement of acquisition.

Camera:
Pictometry utilizes its USGS certified, custom designed mapping camera incorporating a Kodak sensor and custom designed photogrammetric lenses. The sensor is fully calibrated according to Pictometry’s USGS approved calibration process. Pictometry’s sensor provides a dynamic range of 12 bits per band, RGB (resampled to 8 bits during processing).

Ortho-Rectification:
Prior to the production of orthophotography, Pictometry will perform automatic aerial triangulation, utilizing the directly observed Exterior Orientations (EOs) and ground control points (GCPs), measured by a licensed surveyor, for the purpose of orienting the individual frames for creation of the final ortho imagery. In addition to the GCPs, sophisticated matching techniques will be employed to automatically create tie points for use in performing a bundle adjustment. Pictometry will utilize best available Digital Terrain Models, combined with the calibrated camera interior orientations, ground control points, and triangulated EOs to rectify the images. When the rectification requires a resampling of the source imagery, a cubic convolution method will be utilized.

Mosaic:
Global color balancing will be applied to all orthophotos to create homogeneous orthophotos within the project area. Local adjustments of brightness values, color and contrast will be performed if needed. There will be no obvious seam edge between two adjacent orthophotos. Mosaic will be created using automated seamline steering, with manual edits to eliminate feature misalignment caused by seamlines which pass thru features above the elevation surface. Feature alignment across seamlines will be 3 pixels or better. When possible, seamlines will be steered away from elevated features to improve orthophoto quality. Once the mosaic has been produced, the imagery will be tiled and named according to the customer provided (or Pictometry generated) schema for delivery.