



CAECD Board of Managers | Agenda

10:30 a.m., or upon adjournment of the Executive Committee
Wednesday, October 13, 2021
CAPCOG Lantana Room
6800 Burleson Road, Bld. 310, Ste. 165
Austin, Texas 78744

Judge Paul Pape, Bastrop County, **Chair**
Mayor Brandt Rydell, City of Taylor, **First Vice Chair**
Judge James Oakley, Burnet County, **Second Vice Chair**
Mayor Lew White, City of Lockhart, **Secretary**
Judge Ron Cunningham, Llano County,
Parliamentarian
Mayor Jane Hughson, City of San Marcos,
Immediate Past Chair
Council Member Mackenzie Kelly, City of Austin
Mayor Pro Tem Lyle Nelson, City of Bastrop
Council Member Kevin Hight, City of Bee Cave
Judge Brett Bray, Blanco County
Commissioner Joe Don Dockery, Burnet County
Judge Hoppy Haden, Caldwell County
Judge Joe Weber, Fayette County
Mayor Pro Tem Kevin Pitts, City of Georgetown

Commissioner Debbie Ingalsbe, Hays County
Mayor Christine Sederquist, City of Leander
Commissioner Steven Knobloch, Lee County
Council Member Mike Heath, City of Pflugerville
Council Member Matthew Baker, City of Round Rock
Council Member Janice Bruno, City of Smithville
Commissioner Ann Howard, Travis County
Commissioner Brigid Shea, Travis County
Commissioner Russ Boles, Williamson County
Commissioner Cynthia Long, Williamson County
Representative John Cyrier
Representative Celia Israel
Representative Terry Wilson
Representative Erin Zwiener

1. **Call to Order by the Chair**
2. **Consider Approving the Minutes for the September 8, 2021 CAECD Board of Managers Meeting**
3. **Consider Accepting the Financial Report for the Period October 1, 2020 – August 31, 2021**
Lisa Byrd Bowman, Director of Finance
4. **Review Annual Contracts and Recurring Monthly Expenditures for Emergency Communications in FY 2022**
Sheila Jennings, Director of Administration
5. **Consider Amending FY 2022 Budget to Incorporate Unused FY 2021 Project Funds**
Betty Voights, Executive Director
Richard Morales Jr., Director of Emergency Communications
6. **Consider Approving Purchase of Aerial Imagery**
Susan Cooper, GIS Program Manager
Andrew Hoekzema, Director of Regional Planning & Services
7. **Consider Approving GIS Contract**
Andrew Hoekzema, Director of Regional Planning & Services
8. **Consider Approving Appointments to Advisory Committee**
Deborah Brea, Executive Assistant
9. **Staff Reports**
Betty Voights, Executive Director
10. **Adjourn**

A closed executive session may be held on any of the above agenda items when legally justified pursuant to Subchapter D of the Texas Open Meetings Act (Texas Government Code Chapter 551).



CAECD Board of Managers | Summary Minutes

10 a.m., Wednesday, Sept. 8, 2021
Austin Marriott South
4415 S IH 35 Frontage Road
Austin, Texas 78744

Present (23)

Judge Paul Pape, Bastrop County, **Chair**
Mayor Brandt Rydell, City of Taylor, **1st Vice Chair**
Mayor Lew White, City of Lockhart, **Secretary**
Judge Ron Cunningham, Llano County, **Parliamentarian**
Mayor Jane Hughson, City of San Marcos, **Immediate Past Chair**
Council Member Mackenzie Kelly, City of Austin
Mayor Pro Tem Lyle Nelson, City of Bastrop
Council Member Kevin Hight, City of Bee Cave
Commissioner Joe Don Dockery, Burnet County
Judge Hoppy Haden, Caldwell County
Judge Joe Weber, Fayette Count

Mayor Pro Tem Kevin Pitts, City of Georgetown
Commissioner Debbie Ingalsbe, Hays County
Ms. Sandy Cox, City of Lakeway
Mayor Christine Sederquist, City of Leander
Commissioner Steven Knobloch, Lee County
Council Member Mike Heath, City of Pflugerville
Council Member Matthew Baker, City of Round Rock
Council Member Janice Bruno, City of Smithville
Commissioner Ann Howard, Travis County
Commissioner Brigid Shea, Travis County
Commissioner Russ Boles, Williamson County
Commissioner Cynthia Long, Williamson County

Absent (6)

Judge James Oakley, Burnet County, **2nd Vice Chair**
Judge Brett Bray, Blanco County
Representative John Cyrier

Representative Celia Israel
Representative Terry Wilson
Representative Erin Zwiener

1. **Call to Order by the Chair**

Judge Pape called the meeting to order at 11:03 a.m.

2. **Consider Approval of Minutes for the July 14, 2021 CAECD Board of Managers Meeting**

Judge Pape asked for approval of the minutes. A motion was made by Mayor Sederquist to approve the minutes. Commissioner Shea seconded the motion. The motion passed unanimously.

3. **Consider Renewal of Agreement with AT&T for a Fiber Based Backup Network**

Richard Morales Jr., Director of Emergency Communications

Mr. Morales explained that public safety answering points throughout the region have been using the backup network since 2017; however, the backup network is really operating simultaneously with the original network which increases resiliency by ensuring there is no downtime to switch fiber connections if one was to fail. He said the majority of the backup networks are provided through AT&T but some in the more rural areas have another provider. The maintenance cost of the AT&T lines is about \$18,000 which is down from about \$21,000 because of PSAP consolidations.

A motion was made by Commissioner Long to renew the agreement with AT&T to maintain the backup network. Commissioner Shea seconded the motion. The motion passed unanimously.

4. **Receive an Update on Regional ESINet, GIS, and NG 9-1-1 Deployment**

Richard Morales Jr., Director of Emergency Communications

Mr. Morales told the board of managers the region is technically already operating with capacity for Next Generation 9-1-1 (NextGen 9-1-1). He explained numerous infrastructure upgrades were completed to ensure the network quality and stability for NextGen 9-1-1 features can occur, and that those network upgrades have proven stable. However, the ability to transfer a variety of data such as multimedia messages to include videos and pictures across the network is still some months away. CAPCOG is now waiting on AT&T to provide a technical review and testing of software to handle NextGen 9-1-1's data transfer operations, which should be completed by December. It had originally anticipated this would be completed earlier this year. CAPCOG will follow with its own testing to ensure programs are operating to CAPCOG's safety and security standards. Mr. Morales said it is important that such data can safely be obtained by PSAPs while ensuring critical and private information can't be taken from the network. Morales also stated digital mapping requirements to operate NextGen 9-1-1 in all ten counties also should be completed by December.

Council Member Kelly asked when CAPCOG would be able to provide an additional update about transitioning to NextGen 9-1-1. Mr. Morales said he could provide another update at the next board of managers meeting. Mayor Hughson questioned whether the board should be concerned about AT&T's delay. Mr. Morales said there is no reason to worry at this time and thought the December timeline would be met. Ms. Voights reminded the board that CAPCOG is ahead in upgrading to NextGen 9-1-1 and no entity has fully implemented NextGen 9-1-1 yet.

No action was needed on this item.

5. Consider Approving Appointments to CAECD Strategic Advisory Committee
Deborah Brea, Executive Assistant

Ms. Brea announced two proposed appointments to the Capital Area Emergency Communications District Strategic Advisory Committee from the City of Austin — Kenneth Murphy and Mark McCollum.

A motion was made by Council Member Kelly to appoint the two members. Commissioner Shea seconded. The motion passed unanimously.

6. Staff Reports

Betty Voights, Executive Director

Mr. Ritchey gave an update about Warn Central Texas. There are about 1.2 million numbers in the system total. About 600,000 number from a vendor aggregated list, about 50,000 from self-registrations, and the rest from the CAPCOG 9-1-1 database — landlines to homes and business and VoIP phone numbers. Mr. Ritchey also said there are significant improvements coming to the national IPAWs system, a system separate from the Warn Central Texas which will increase its ability to reach more people. With such improvements, everyone should receive disaster alerts when they occur.

7. Adjourn

Judge Pape adjourned the meeting at 11:17 a.m.

Mayor Lew White, Secretary
Capital Area Emergency Communications District Board of Managers
Capital Area Council of Governments

Date

**CAPITAL AREA EMERGENCY COMMUNICATIONS DISTRICT
BOARD OF MANAGERS MEETING**

MEETING DATE: October 13, 2021

AGENDA ITEM: #3 Consider Accepting the Financial Report for the Period
October 1, 2020 to August 31, 2021

GENERAL DESCRIPTION OF ITEM:

This is the fiscal year to date financial report for CAECD, for the eleven months October 1, 2020 to August 31, 2021. Included in the report is the Balance Sheet indicating total assets, liabilities, and fund equity as of August 31, 2021. Also included in the report is the Statement of Revenues and Expenditures as of August 31, 2021.

Total Revenues as of August 31, 2021	\$ 13,826,856.91
Total Expenditures as of August 31, 2021	\$ 10,320,772.27

The financial statements have been prepared in accordance with applicable state and federal requirements and are unaudited.

THIS ITEM REPRESENTS A:

- New issue, project or purchase
- Routine, regularly scheduled item
- Follow-up to previously discussed item
- Special item requested by board member
- Other

PRIMARY CONTACT/STAFF MEMBER: Lisa Bowman, CAPCOG Director of Finance

BUDGETARY IMPACT OF AGENDA ITEM:

Total estimated cost: N/A

Source of funds:

- | | | |
|---|------------------------------|-----------------------------|
| Is item already included in fiscal year budget? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Does item represent a new expenditure? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Does item represent a pass-through purchase? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
- If so, for what city/county/etc.? _____

PROCUREMENT: N/A

ACTIONS REQUESTED:

Accept the financial report for the period of October 1, 2020 to August 31, 2021

BACK-UP DOCUMENTS ATTACHED:

1. Unaudited Balance Sheet as of August 31, 2021
2. Unaudited Statement of Revenues and Expenditures as of August 31, 2021

BACK-UP DOCUMENTS NOT ATTACHED (to be sent prior to meeting or will be a handout at the meeting): None

Capital Area Emergency Communications District
Balance Sheet - **Unaudited**
August 31, 2021

Assets

Cash and Short Term Investments	\$ 30,773,765.20
Accounts Receivable	978,209.60
Other Assets	1,820,762.54
Total Assets	<u>\$ 33,572,737.34</u>

Liabilities and Fund Equity

Accounts Payable	\$ 579,264.61
Due to CAPCOG	217,268.57
Total Liabilities	<u>\$ 796,533.18</u>
Beginning Fund Balance	\$ 29,270,119.52
Change in Fund Balance	3,506,084.64
Total in Fund Equity	<u>\$ 32,776,204.16</u>
Total Liabilities and Fund Equity	<u>\$ 33,572,737.34</u>

Capital Area Emergency Communications District
Statement of Revenue and Expenditures - Unaudited
For the Eleven Months Ending August 31, 2021

	Fiscal Year to Date Actual	Total Budget	Percent Total Budget Remaining
Revenue			
Checking Acct Interest	\$ 118.70	\$ 1,000.00	88.1%
Investment Interest	\$ 12,141.65	\$ 149,000.00	91.9%
911 Wireline Fees	\$ 2,733,130.03	\$ 3,532,250.00	22.6%
911 Wireless Fees	\$ 9,649,287.04	\$ 9,547,200.00	-1.1%
911 Prepaid Wireless Fees	\$ 1,382,317.03	\$ 1,656,400.00	16.5%
911 Private Switch	\$ 29,812.46	\$ 43,350.00	31.2%
911 Other Revenues	\$ 20,050.00	\$ 20,050.00	0.0%
Total Revenue	\$ 13,826,856.91	\$ 14,949,250.00	7.5%
Expenditures			
911-Program Management	\$ 2,234,681.30	\$ 2,721,640.00	17.9%
911-Network	\$ 3,842,365.61	\$ 5,341,088.00	28.1%
911-GIS/DB Maintenance	\$ 1,818,556.79	\$ 2,729,905.00	33.4%
911-Equipment Maintenance	\$ 612,601.62	\$ 2,125,405.00	71.2%
911-PSAP Services	\$ 474,745.91	\$ 922,201.00	48.5%
911-Training & Education	\$ 251,749.13	\$ 328,488.00	23.4%
911-Capital Assets	\$ 566,066.90	\$ 5,020,000.00	88.7%
Regional Notification System	\$ 373,697.50	\$ 577,042.00	35.2%
WebEOC	\$ 146,307.51	\$ 179,011.00	18.3%
Total Expenditures	\$ 10,320,772.27	\$ 19,944,780.00	48.3%
Net Revenue Over/(Under) Expenditures	\$ 3,506,084.64	\$ (4,995,530.00)	

**CAPITAL AREA EMERGENCY COMMUNICATIONS DISTRICT
BOARD OF MANAGERS MEETING**

MEETING DATE: October 13, 2021

AGENDA ITEM: #4 Review Annual Contracts and Recurring Monthly Expenditures for Emergency Communications in FY 2022

GENERAL DESCRIPTION OF ITEM:

The purpose of this item is to inform the Board of major expenditures on an annual basis for which we are already committed to pay due to an earlier procurement or contract. These include contracted services procured through cooperative purchasing as well as those which are available only from one provider such as many of our 9-1-1 services. These are recurring monthly 9-1-1 network charges, database and interpreter services, geospatial mapping, maintenance agreements, and equipment purchases approved in prior fiscal years.

Staff has prepared a listing for review of these expenditures on an annual basis to the CAECD Board of Managers. The listed items are included in the approved FY 2022 CAECD budget and represent expenditures for a specific account or service performed by a vendor that may exceed \$50,000 annually. Although subject to fluctuation, staff will seek approval for any increases that exceed budget authorization.

THIS ITEM REPRESENTS A:

- New issue, project, or purchase
- Routine, regularly scheduled item
- Follow-up to previously discussed item
- Special item requested by board member
- Other

PRIMARY CONTACT/STAFF MEMBER:

Sheila Jennings, Director of Administration

BUDGETARY IMPACT OF AGENDA ITEM:

Total estimated cost: \$6,014,621

Source of funds: 9-1-1 Fees

Is item already included in fiscal year budget? Yes No

Does item represent a new expenditure? Yes No

Does item represent a pass-through purchase? Yes No

If so, for what city/county/etc.? _____

PROCUREMENT: Items are subject to cooperative purchase or interlocal agreements or have been competitively procured in a prior year.

ACTION REQUESTED:

Information item – no action required.

BACK-UP DOCUMENTS ATTACHED:

1. FY 2022 CAECD Estimated Recurring/Contract Annual Expenditures

BACK-UP DOCUMENTS NOT ATTACHED (to be sent prior to meeting or will be a handout at the meeting): None

**Capital Area Emergency Communications District
FY 2022 Estimated Recurring/Contract Annual Expenditures***

Vendor	Program	Description	Estimated Annual Total
AT&T	Network	ASE Backup	227,196
AT&T	Network	NG 9-1-1	1,564,624
AT&T	Maintenance	Dedicated techs & circuit monitoring	747,672
AT&T	PSAP	ECats MIS Reporting	114,405
City of Austin	Maintenance	Voice Recorder	119,480
DIR	Network	MPLS/NG 9-1-1 Charges	753,225
ESI Acquisitions/Intermedix	Other Emergency Communications Systems	WebEOC Contractual Services	70,000
Everbridge	Other Emergency Communications Systems	Regional Notification System & Services	356,653
Frontier	Network	9-1-1 Selective Routing & Business Lines	245,701
Geocomm	GIS	Data Hub Services	78,450
Greater Harris	Program Management	9-1-1 Alliance Membership	112,303
LLS/Voiance	PSAP	Interpreter Services	132,158
Power Quality Scales	Maintenance	Generator PM & UPS Battery Replacement	59,655
Priority Dispatch	Training & Education	Software, Training & Certifications	1,010,755
Sprint	Network	Wireless Recovery Fee	142,899
Surdex	PSAP	Aerial Mapping	215,000
Telecommunications Systems (TCS)	Network	Circuit Connectivity/Maintenance & Monitoring	64,445
		Total	6,014,621

*Listed expenditures are for a specific account or service performed by a vendor/contractor that may exceed \$50,000 annually.

**CAPITAL AREA EMERGENCY COMMUNICATIONS DISTRICT
BOARD OF MANAGERS MEETING**

MEETING DATE: October 13, 2021

AGENDA ITEM: #5 Consider Amending FY 2022 Budget to Incorporate Unused FY 2021 Project Funds

GENERAL DESCRIPTION OF ITEM:

The purpose of this item is to approve the carry forward of unspent FY 2021 funds totaling \$1,487,171 into FY 2022 for Capital Equipment & Replacements. Requests totaling \$1,487,171 in carry-forward funds consist of the following: \$142,141 for the BUC/RBUC/DSR (Motorola & 911) project; \$243,456 for the purchase of Burnet County Dispatch Consoles; \$535,574 for the Caldwell County Radio Tower project; and \$566,000 for the Hays County Secondary Connectivity project, all of which are in progress. A summary chart is attached.

These purchases and projects were delayed due to purchasing avenues, system/vendor delays, and inter-local agreement finalizations.

THIS ITEM REPRESENTS A:

- New issue, project, or purchase
- Routine, regularly scheduled item
- Follow-up to previously discussed item
- Special item requested by board member
- Other

PRIMARY CONTACT/STAFF MEMBER:

Richard Morales, Jr., Director of Emergency Communications

BUDGETARY IMPACT OF AGENDA ITEM:

Total estimated cost: \$1,487,171

Source of funds: 9-1-1 Fees

Is item already included in fiscal year budget? Yes No

Does item represent a new expenditure? Yes No

Does item represent a pass-through purchase? Yes No

If so, for what city/county/etc.? Austin, Burnet County & Caldwell County

PROCUREMENT: N/A

ACTION REQUESTED:

Approve the Amendment to FY 2022 CAECD budget as outlined in this item.

BACK-UP DOCUMENTS ATTACHED:

1. Budget Carry-Forward Funds Summary

BACK-UP DOCUMENTS NOT ATTACHED (to be sent prior to meeting or will be a handout at the meeting): None

Proposed FY 2021 Budget Carry-Forward Funds to FY 2022

	FY 2021 Budget*	FY 2022 Carry-forward	FY 2022 Approved July 2021	FY 2022 Amended Oct 2021
8. Capital Equipment & Replacement				
BUC/RBUC/DSR	1,621,170	142,141	810,585	952,726
Burnet County Disptach Consoles	243,456	243,456	121,728	365,184
Caldwell County Tower Site	535,574	535,574	267,687	803,261
Hays County Secondary Connectivity	566,000	566,000	-	566,000
Total	2,966,200	1,487,171	1,200,000	2,687,171

*As Amended on 5/12/2021

**CAPITAL AREA EMERGENCY COMMUNICATIONS DISTRICT
BOARD OF MANAGERS MEETING**

MEETING DATE: October 13, 2021

AGENDA ITEM: #6 Consider Approving Purchase of Aerial Imagery

GENERAL DESCRIPTION OF ITEM:

The purpose of this item is to authorize purchase of updated aerial imager from Surdex Corporation to support the 9-1-1 GIS mapping program. The CAECD funds the annual purchase of aerial imagery to update public safety answering point (PSAP) mapping applications to ensure accurate public safety dispatch and response. Regional Planning and Services staff, who oversee the GIS department, coordinated the procurement of this imagery, and since 2017, has conducted these procurements as cooperative purchases through the Texas Natural Resource Information Service (TNRIS) "StratMap" program. This program allows agencies to select pre-screened vendors that have already entered into contracts with the state, enabling a streamlined procurement process and discounts for participants.

This year, CAPCOG is proceeding with the acquisition of this imagery on its own rather as part of a joint project. This is due to changes in the way TNRIS plans to support the Stratmap program moving forward and the availability of a new subscription-based imagery service that should meet the needs of our local government but does not meet the needs of the 9-1-1 program. Staff selected Surdex Corporation as the vendor for the 2022 contract based on past performance for CAPCOG in 2020 and 2021, and their 2022 proposal is being offered at the same rates as CAPCOG paid in each of those years. The total cost of this contract includes \$185,640 for the acquisition and \$5,800 to host the data for up to 1 year after delivery. The amount budgeted for this item for FY 2022 is \$215,000.

THIS ITEM REPRESENTS A:

- New issue, project, or purchase
- Routine, regularly scheduled item
- Follow-up to a previously discussed item
- Special item requested by board member
- Other

PRIMARY CONTACT/STAFF MEMBER:

**Susan Cooper, GIS Program Manager
Andrew Hoekzema, Director of Regional Planning & Services**

BUDGETARY IMPACT:

Total estimated cost: \$191,440

Source of Funds: CAECD revenue

Is item already included in fiscal year budget? Yes No

Does item represent a new expenditure? Yes No

Does item represent a pass-through purchase? Yes No

If so, for what city/county/etc.? n/a

PROCUREMENT: Cooperative Purchase

ACTION REQUESTED:

Approve Issuance of Purchase Order to Surdex Corporation for 2022 Aerial Imagery

BACK-UP DOCUMENTS ATTACHED:

1. Procurement Memo
2. Surdex Proposal

BACK-UP DOCUMENTS NOT ATTACHED (*to be sent prior to meeting or will be a handout at the meeting*): None



BASTROP BLANCO BURNET CALDWELL FAYETTE HAYS LEE LLANO TRAVIS WILLIAMSON

MEMORANDUM
September 21, 2021

TO: Executive Committee

FROM: Andrew Hoekzema, Director of Regional Planning and Services

RE: 2022 Aerial Imagery Procurement

The procurement process has been completed to acquire 12-inch resolution aerial imagery from Surdex Corporation to support CAPCOG 9-1-1 mapping applications; the area will be flown in in January and February 2022. GIS program staff procured this service through Section 3-207 of CAPCOG’s procurement policy, which authorizes cooperative purchases, and the Texas Natural Resource Information Service’s (TNRIS’s) “StratMap” program (<https://tnris.org/stratmap/>).

Unlike in recent years, when TNRIS staff conducted a competitive procurement process for a joint purchase of imagery within the CAPCOG region and nearby regions, this year CAPCOG is purchasing this imagery on its own and selected Surdex as the vendor based on past performance for 2020 and 2021 imagery and comparable pricing and services offered for 2022 imagery acquisition. CAPCOG staff have had good experiences working with Surdex staff over the past two years and have been happy with the results.

Surdex’s base price of \$21.00 per “tile” for 12-inch orthoimagery for 2022 is identical to the price per tile CAPCOG paid in 2020 and 2022, but the total cost of acquisition for 2022 will be higher since CAPCOG will be paying these costs entirely on our own rather than other jurisdictions underwriting the costs of the imagery acquisition in their jurisdictions, as was occurring in the past. Total budgeted for this item was \$215,000.

Table 1. 2022 Imagery Acquisition Costs Compared to 2020 and 2021 Costs

Year	12-Inch Tiles Acquired by CAPCOG	Acquisition Cost to CAPCOG at \$21.00 per tile	Tiles Acquired by Local Governments	“Underwriting” from Local Governments for Regional Imagery
2020	8,718	\$183,078.00	122	\$2,562.00
2021	7,819	\$164,619.00	1,001	\$21,021.00
2022	8,840	\$185,640.00	0	\$0.00

The price offered by Surdex includes a 27% discount for organizations acquiring the imagery through the StratMap program – it would otherwise cost \$28.76 per tile, for a total cost of \$254,238.

In the past, participating local governments would pay the cost of higher-resolution imagery for their specific areas and the 9-1-1 program would pay for all of the remaining areas so that the full region's data was obtained. This process did result in costs savings for the purchase of imagery, but required staff time to coordinate and manage as a region-wide project. With TNRIS now offering high-resolution imagery to local governments through its Texas Imagery Service, a data subscription service TNRIS houses and maintains, there did not appear to be any added benefit to local governments participating in a joint procurement with CAPCOG. Without the participation of other local governments in our purchase, there would not be the cost break that CAPCOG was receiving previously. As a result, staff decided that it would be best to proceed with this project on our own rather than trying to recruit other jurisdictions to participate.

Staff did evaluate whether TNRIS's Texas Imagery Service would meet CAPCOG's needs. However, while the subscription service provides annual updates for imagery in the Austin Urban Area, other areas of the region would only be updated every two to three years and therefore is not sufficiently current for regional 9-1-1 purposes.

In addition to acquisition costs, staff are also seeking approval for \$5,800.00 to pay Surdex for hosting the data remotely for up to 12 months after final delivery (i.e., from Summer 2022 – Summer 2023). While CAPCOG usually hosts imagery data in-house we are still evaluating whether adding server space for data storage or hosting it remotely will be more cost-effective, and would like to have the flexibility to adoption to the contracted services if we determine that it better meets CAPCOG's needs.

TECHNICAL PROPOSAL

Capital Area Council of Governments

Orthoimagery in the Capital Area (10 Counties)



SUBMITTED TO

Susan Cooper

GIS Program Manager
Capital Area Council of Governments

SUBMITTED BY

Ed Turner

Vice President, Business Development
Office: (636) 368-4400
Email: edt@surdex.com

Cornell Rowan, CP

Project Manager
Office: (636) 368-4460
Mobile: (912) 222-4075
Email: cornellr@surdex.com



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TECHNICAL PROPOSAL

Capital Area Council of Governments
Orthoimagery in the Capital Area (10 Counties)



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COVER LETTER

September 15, 2021

Susan Cooper
GIS Program Manager
Capital Area Council of Governments

REGARDING: 2022 Orthoimagery

Dear Capital Area Council of Governments,

Surdex is pleased to submit our proposal to the Capital Area Council of Governments for the acquisition and production of orthoimagery in the Texas capital area. We have completed numerous successful projects in Texas over the past decade. In the past 36 months, Surdex's ability to deliver orthoimagery requiring minimal client review has been acknowledged as providing a significant internal cost and time savings by the Houston-Galveston Area Council, Smith County Texas GIS Consortium, Texas Natural Resources Information System and Capital Area Council of Governments. Surdex will provide the same level of quality product for this project.

Surdex completed the 2020 and 2021 orthoimagery projects for the Capital Area Council of Governments. These successful projects demonstrate Surdex's thorough understanding of the unique land cover and airspace issues in the region.

Surdex Senior Project Manager and Certified Photogrammetrist Cornell Rowan will be assigned to the 2022 project, backed up by Surdex's Director of Project Management Wade Williams, CP. Cornell and Wade have a combined 50 years of project management experience and have managed over 720,000 square miles of orthoimagery projects in the State of Texas since 2010. These projects include the Texas Statewide Project as well as projects for the Houston-Galveston Area Council, Brazos County, South Texas Consortium, Ark-Tex Council of Governments, and Smith County GIS Consortium. The ground sample distance (GSD) for these projects ranged from 3" to 18" GSD.

Surdex was awarded its second Texas DIR contract in August 2021, allowing government entities within Texas to acquire geospatial products through a network of pre-approved contractors. This proposal contains a description of the base standard specifications for orthoimagery acquisition/production and accuracy within the State of Texas and a discount schedule consistent with Surdex's Texas contract - [DIR-CPO-4496](#).

During the 2020 and 2021 orthoimagery projects, the TNRIS Project Manager elected not to take advantage of Surdex Flight Tracker during acquisition or Surdex SurCheck for QA/QC. Surdex will provide a link to Surdex Flight Tracker for the orthoimagery in the Texas Capital Area, and SurCheck will be available for QA/QC, if desired. Flight Tracker allows online real-time tracking of our aircraft during acquisition, the most critical phase of any project. This service will be made available to all project contacts, and daily status reports will be provided by Cornell Rowan, Project Manager, during acquisition. We will also provide preliminary orthoimagery through an online image service within 15 days of completion of acquisition. This will be accessible through unlicensed desktop or mobile viewing, or in any GIS application.

TECHNICAL PROPOSAL

Capital Area Council of Governments
Orthoimagery in the Capital Area (10 Counties)



The addition of our fifth twin-turbine aircraft in 2020 allowed additional acquisition capacity for contingency during the acquisition phase of your project. All five Surdex ADS100 sensors are now installed in twin-turbine aircraft, reducing mobilization time to clear skies during the acquisition phase of a project. Our acquisition resources are critical to successful project execution, and they are supported by proven project manager communications and timely delivery of quality data by Surdex's production staff. Additionally, our project manager and production staff understand the attention required to satisfy the unique requirements of the Capital Area Council of Governments up to and including delivery of ancillary products not included in the original specification.

If you have any questions or if we may assist you in any way, please do not hesitate to contact us.

Sincerely,

A handwritten signature in blue ink, appearing to read "Ed Turner".

Ed Turner
Vice President, Business Development
Office: (636) 368-4400
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A handwritten signature in blue ink, appearing to read "R. C. Hoffmann".

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PROJECT PLAN

A. PROJECT PLAN AND EXECUTION

SCOPE OF WORK	
CLIENT	
CAPITAL AREA COUNCIL OF GOVERNMENTS	
GROUND SAMPLE DISTANCE (GSD)	APPROXIMATE AOI
12" BASE PROJECT	8,840 DO4Qs

1) PROJECT DESIGN

The project design is based on the deliverable tile layout and a buffer around the exterior boundary. It includes a flight design and a control survey design. Flight planning is the responsibility of Surdex’s flight acquisition manager, and each flight plan is reviewed and approved by the project manager. The Triangulation and Survey staff design the ground control network under the direct supervision of a Certified Photogrammetrist and a Registered Land Surveyor.

Imagery Flight Design

The flight design is based on the following parameters:

FLIGHT DESIGN PARAMETERS		
PARAMETER	SETTING(S)	COMMENTS
FLYING HEIGHT (AGL)	12" GSD: 12,300' AGL	Based on sensor-specific parameters (height: GSD ratio is focal length divided by CCD pixel size). Planning software will ensure the target GSD is not exceeded (numerically larger) in rugged areas by using an elevation model.
COVERAGE	Stereoscopic	Extends to the buffered tile layout to ensure stereo coverage and to provide alternative orthoimagery during mosaicking.
MINIMUM SUN ANGLE	30°	
SIDELAP	Minimum 30%	For urban areas, sidelap is increased to reduce building lean in “urban canyons” and flight lines are oriented to capture small areas as close to the center of the strip as possible to maximize the nadir view.
FLIGHT LINE ORIENTATION	Optimized to the area of interest	Design may include diagonal flight lines for either acquisition efficiency or to align with major streets/avenues in built-up areas.
LENGTH OF FLIGHT LINE	Generally < 80 miles	To accommodate IMU drift limitations, flights and flight lines not to exceed approximately 20-30 minutes in duration.

Ground Survey Design

After the flight design is complete, Surdex will determine the number and placement of control points that will be required to ensure product accuracy and independent check points required for validation of the deliverables.

Ground control points are surveyed to provide a connection between the ground coordinate system and the imagery coordinate system. All imagery will be acquired with a geodetic grade GNSS receiver on the aircraft to reduce the number of ground control points needed. For this project, Surdex will select photo-identifiable point locations and (if needed) target ground control points in an evenly distributed pattern throughout the project area.

As a quality check process, Surdex will also photo-identify, target and survey QC check points. These points, independent of the control points, are to be used exclusively in the quality check process to evaluate the accuracy of the final digital orthoimagery. This QC process will ensure that the digital orthophotography meets ASPRS accuracy standards as outlined in the specifications.

Our design approach includes:

- Re-use of control and QC points from the 2022 project where possible
- Individual control/check points will be either paneled or photo-identifiable
- Overall uniform dispersion of control over the entire project
- Focus on placing control at junctions of strips, maximizing the number of observations of control points during triangulation to strengthen the solution

Preliminary Flight and Control Diagram

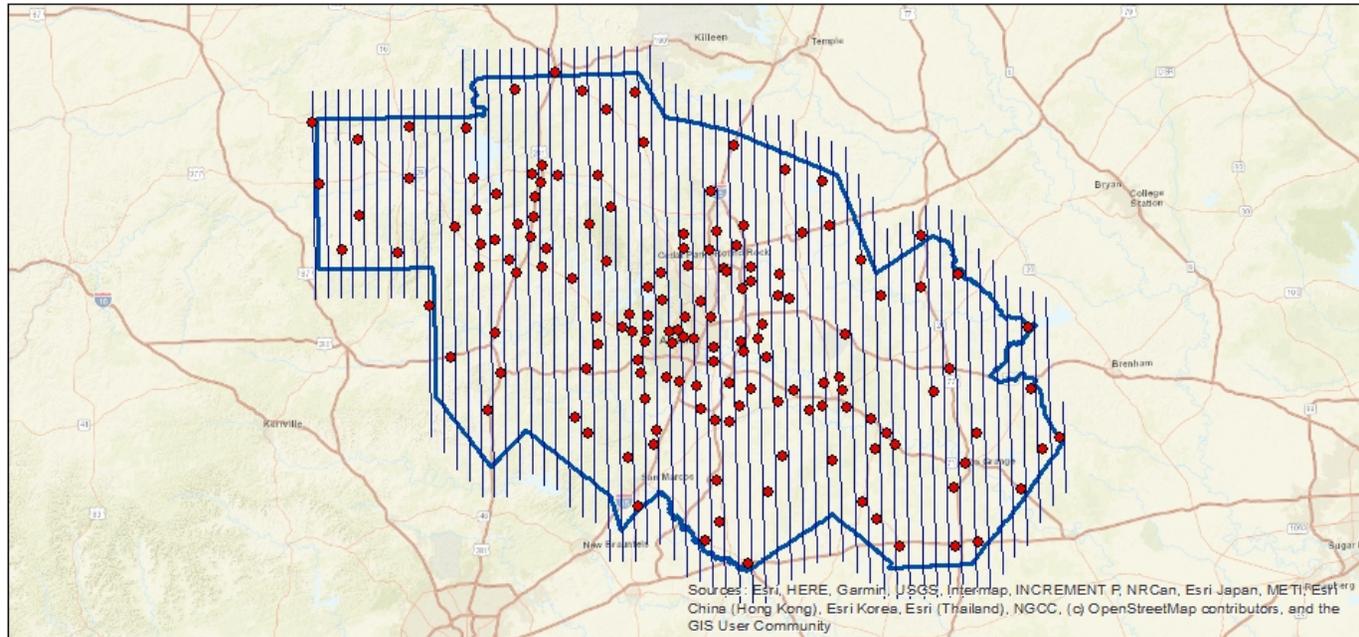
The following page contains a preliminary flight and control diagram for 12" GSD imagery for the 10-county area of interest, 8,840 DO4Qs. The final flight plan and control layout will be selected based on the finalized 12" AOI and condition of prior project survey points.

TECHNICAL PROPOSAL

Capital Area Council of Governments
Orthoimagery in the Capital Area (10 Counties)



FLIGHT AND CONTROL DIAGRAM 12" GSD CAPITAL AREA COUNCIL OF GOVERNMENTS



Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community



Legend

- Ground control/QC points
- Flight lines
- ▭ Project area of interest



2) ACQUISITION EQUIPMENT

Aircraft

Surdex’s Cessna 441 (Conquest) will be used on this project to host the ADS100 sensor. The Conquest aircraft are the highest performing and most versatile aircraft in our fleet for imagery acquisition and can be ferried to the project area from our headquarters within two hours, ensuring maximum use of available clear weather. The RVSM equipment and advanced radar allow us to ferry safely at night. Our Rockwell Turbo Commander and Cessna 414A are also suitable for this project and will be the back-up aircraft if needed. Aircraft assigned to the project will be based at airports within the project area to take advantage good weather and maximize on-line time during required sun angle periods.

SURDEX’S ACQUISITION AIRCRAFT FOR SOW #580-21-SOW-0001

MAKE AND MODEL OF AIRCRAFT

<p>CESSNA 441 CONQUEST II-10 (WITH RVSM*)</p>	<p>Number of Aircraft: 4 Engine: Twin-turbine pressurized Flight Range: 2,193 nm Operating Ceiling: 35,000’ Cruise Speed: ~310 knots</p>	
<p>ROCKWELL TURBO COMMANDER 690B</p>	<p>Number of Aircraft: 1 Engine: Twin-turbine pressurized Flight Range: 1,400 nm Operating Ceiling: 31,000’ Cruise Speed: ~270 knots</p>	
<p>CESSNA 414 CHANCELLOR III</p>	<p>Number of Aircraft: 1 Engine: Twin-piston pressurized Flight Range: 900 nm Operating Ceiling: 30,200’ Cruise Speed: ~235 knots</p>	

* RVSM: Reduced Vertical Separation Module. This FAA-certified equipment allows operation above 28,000’ (MSL).

TECHNICAL PROPOSAL

Capital Area Council of Governments
Orthoimagery in the Capital Area (10 Counties)



Sensors

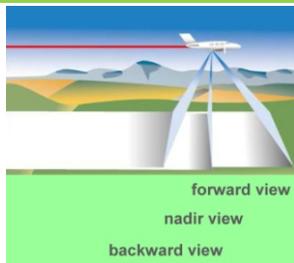
Surdex owns five Leica ADS100 Airborne Digital Sensors, making our installation the largest in the United States and one of the largest in the world. Suredex-led teams have logged over 6.4 million square miles of coverage with the ADS100 as our primary sensor since late 2013.

The pushbroom imaging geometry of the ADS100 includes sets of arrays in the forward, nadir (down), and back configurations, collecting imagery simultaneously to produce a “pixel carpet” of the ground. The off-nadir arrays provide alternative views for ortho and stereoscopic coverage. Each set of arrays acquires at full resolution in red, green, blue, and near infrared.

Leica ADS100 installation in a Cessna 441 (Conquest)



LEICA ADS100 IMAGING OPERATIONS ARRAYS (COURTESY OF LEICA GEOSYSTEMS)



ARRAY	BANDS	FROM NADIR	FOV	PIXELS
Forward	RGBN	25.6°	65.2°	16,000
Nadir	RGGBN	0°	77.3°	20,000
Backward	RGBN	19.4°	71.4°	18,000

Pushbroom systems present optimal imaging geometry for digital orthoimagery and support highly efficient production:

- **Minimized building lean, forward or back:** With the image displacement only varying across the format—and not radial from the center as with frame-format cameras—the amount of elevated feature lean in the final product is dramatically reduced.
- **Significantly fewer seamlines than frame cameras:** The pixel carpet acquired by the ADS100 substantially reduces the number of seamlines required to mosaic the orthoimages, reducing the production effort and minimizing the possibility of seamline artifacts. Correspondingly, the orthoimagery inspection effort is reduced.
- **The strongest stereo viewing available:** The ADS100 stereoscopic geometry yields the highest attainable horizontal and vertical accuracies and can meet the most stringent ASPRS standards. The ADS100 stereoscopic geometry is superior to the 9”x9” film cameras relied upon for decades.

TECHNICAL PROPOSAL

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- **Uniform color edge to edge:** With the telecentric lens design of the ADS100, all light rays strike the focal plane perpendicular to the arrays, resulting in a uniform response to color. ADS100 images generate a product with high quality color.
- **No pan-sharpening:** With each band (R, G, B, NIR) in each array collecting at full resolution, features imaged by the ADS100 do not exhibit the blooming and smearing attributed to the pan-sharpening approach taken by virtually every large-format digital frame camera on the market today. This enhances interpretation and results in an aesthetically pleasing rendition of color.
- **Better color for classification:** The spectral responses of the bands do not overlap, making the ADS100 ideal for automated image classification.

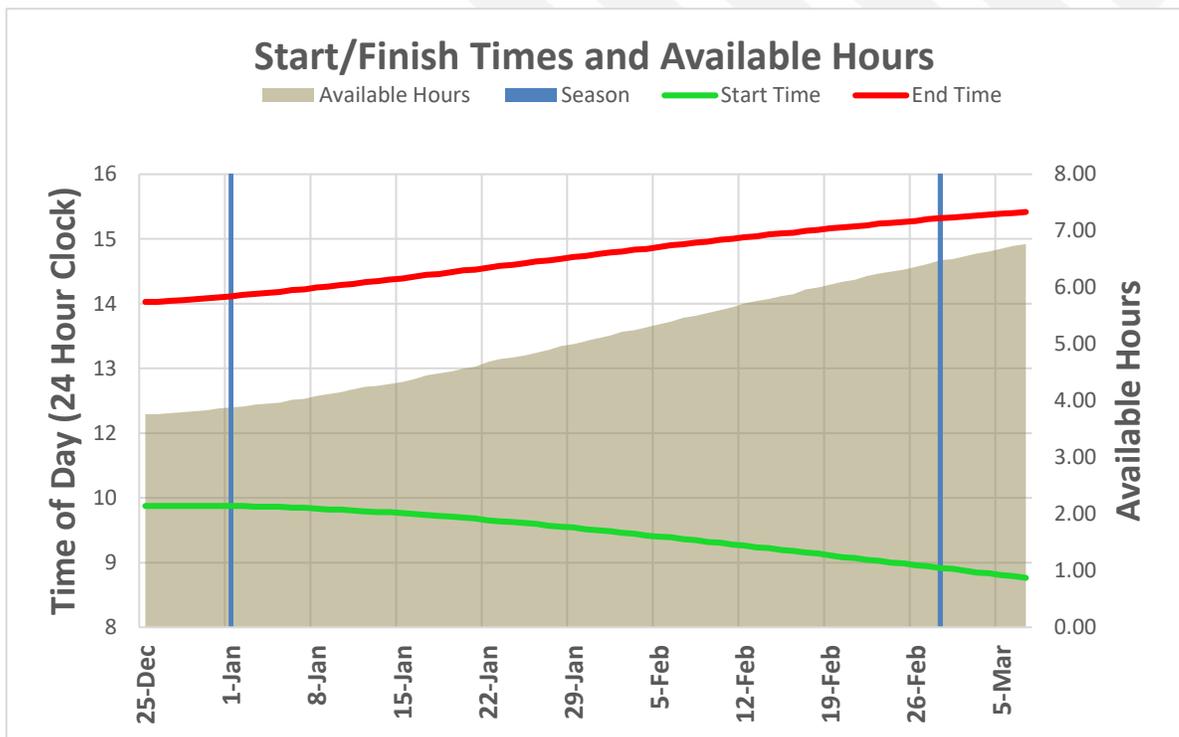
LEICA ADS100 SPECIFICATIONS

PARAMETER	VALUE	PARAMETER	VALUE
SENSOR TYPE	Pushbroom	VIEW ANGLES	Forward: 25.6°
PAN-SHARPENING	None		Back: 19.4°
CROSS-TRACK PIXELS	Forward: 16,000		Stereo: 45°
	Nadir: 20,000	B/H RATIO	0.80
	Backward: 18,000		(Traditional film cameras: 0.6)
FOCAL LENGTH	62.7 mm	RADIOMETRIC RESOLUTION	14 bits/pixel
F-NUMBER	f4	IMAGING ARRAYS	3 Arrays:
PIXEL SIZE	5.0 um	R = red	Forward: RGBN
PIXEL REGISTRATION ACCURACY	1 um	G = green	Nadir: RGGBN
INTEGRATION TIME	≥ 0.5 ms	B = blue	Back: RGBN
HEIGHT: GSD RATIO	12,500:1	N = near infrared	
CROSS-TRACK FIELD OF VIEW (FOV)	77.3°	RADIOMETRIC RESPONSE (NM):	
		Red	619-651
		Green	525-585
		Blue	435-495
		Near Infrared (NIR)	808-882

3) ACQUISITION PLAN WITH ASSUMPTIONS FOR WEATHER

Movement of aircraft to and from project areas is done by Surdex’s chief pilot in coordination with the project manager. This is a complex process aided by the vast experience in acquisition Surdex has gained in over a half-century of aerial data capture. It involves tracking short- and long-term weather patterns and the progress of each project. Weather data for each project area is automatically loaded into our central database for consultation and historical study. The Surdex project manager will keep the Capital Area Council of Governments apprised of aircraft movements into and out of the project areas.

The following chart illustrates the available start and finish hours along with total available hours across the acquisition season of January 1, 2022 – February 28, 2022; this based on a minimum 30° sun angle. This amounts to approximately 300 available hours for the 59-day period. The total acquisition time for the base project is approximately 20.5 hours.



Surdex’s leaf-off acquisition experience within the State of Texas in recent years will be invaluable to ensure successful capture. Our general assumption regarding “sit days” (awaiting weather or clearance to fly airspaces) is that we have approximately 1 sit day per 3 days of acquisition. Imagery will be captured when the sky is free from clouds, cloud shadows, high overcast clouds causing low illumination, haze, fog, smoke and dust. Surdex understands that cloud/cloud shadow cover must be less than 5% per final uncompressed image tile and less than 5% of the entire AOI. Ground features will be free of excessive water due to rain or snow. Light conditions will ensure images are free from smear, blur, excessive glare or noise.

Flight Planning

Flight planning is the responsibility of Surdex’s flight acquisition manager, and each flight plan is reviewed and approved by the project manager. Surdex uses the Leica MissionPro flight planning software for acquisition planning with the ADS100. This software utilizes an elevation model to rigorously check for adequate forward overlap and sidelap coverage as well as desired product GSD. Flights are planned against the buffered coverage for the desired seasonal window portion for the project area.

The flight planning software addresses rugged or uneven terrain in two ways:

- The targeted GSD is treated as a “maximum” value by the software and is never exceeded when compared to the terrain model. This may require “line breaks” to alter the flying height in very rugged terrain.
- The sidelap setting is treated as a “maximum” value and the spacing between lines is modified to ensure the value is not exceeded.

Imagery acquisition is the most critical project phase. The most important facet of acquisition is the focus on an extremely high degree of communication between Surdex’s chief pilot and all aircrews. Flight plans are updated each evening in the central database and re-distributed to aircrews via the internet and/or e-mail. Daily communication and coordination between the chief pilot and aircrews ensure that acquisition is maximized.

Surdex’s chief pilot will inform the local Air Traffic Control (ATC) and/or military air traffic control authority in advance of flight operations. This includes providing aircraft tail numbers and flight designs to ensure the local authority is fully informed.

Before each acquisition day several activities are undertaken by the aircrew:

- Aircraft, GNSS, IMU, and camera are all inspected for proper operation.
- Final weather checks are made.
- Up-to-date flight plans are downloaded and reviewed.
- Flight plans are filed with the local airport/FAA.
- If required, base stations are set up.

At the end of each acquisition day:

- Aircraft, GNSS, IMU, and camera are all inspected for proper operation.
- Aircraft mission logs are completed.
- Data drives are shipped overnight to the production center.

To maintain a clear report on the remaining work, we combine the daily progress each plane has made with the results from inspection of acquisition from previous days. This is all done in the database, so an up-to-date view of the data is always available.

Aircrews generate a flight report for each mission that is used by the production center to appraise the results of each day’s acquisition. For example, if extreme turbulence or cloud cover is cited by the aircrew for specific areas of the acquisition, prioritized attention is paid to these areas by the inspectors.

It is critical to collect GNSS/IMU data with the highest possible integrity, considering these primary factors:

- Operation of base stations to maintain a reasonable distance to the project area.
- Avoiding IMU drift by limiting the length of lines – generally less than 20 minutes.
- Using CORS (Continuously Operating Reference Stations) and/or local GNSS reference networks to provide multiple observations.

Geometric Processing

Geometric processing is the application of the most recent sensor calibration data to the imagery using the sensor manufacturer’s software. This includes provisions for principle point offsets, focal length, lens distortion, and position of the CCD pixels.

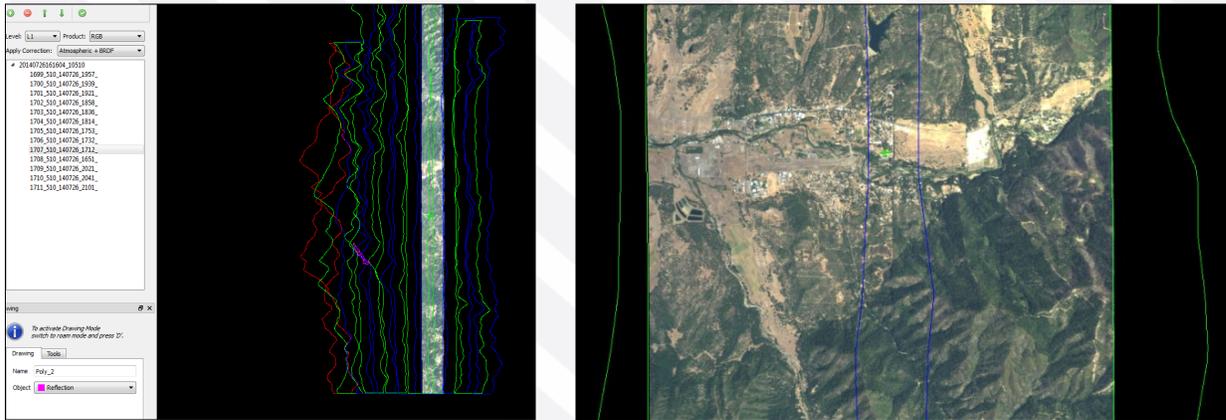
Acquisition Inspection

Immediately following acquisition, imagery is inspected to ensure complete coverage of the project area that is free from imperfections before commencing production.

Rapid imagery inspection is critical to the overall success of a project, so all imagery is viewed and graded, and the inspection results are stored in our central database. This approach enables a qualified and timely determination to be made regarding the possible need for re-flights and guarantees proper image quality.

EXAMPLE IMAGERY INSPECTION ITEMS		
ITEMS INSPECTED VISUALLY	ITEMS INSPECTED ANALYTICALLY	ITEMS INSPECTED VISUALLY AND ANALYTICALLY
<ul style="list-style-type: none"> • Clouds/cloud shadow • Smoke/haze • Excessive flooding/standing water • Excessive ice/snow • Image motion • Specular reflection 	<ul style="list-style-type: none"> • Verify acquisition parameters are met • Sun angle • Forward lap • Sidelap • Crab • Tilt 	<ul style="list-style-type: none"> • Trajectory processing • Pixel/band registration • Camera misfires • Image artifacts

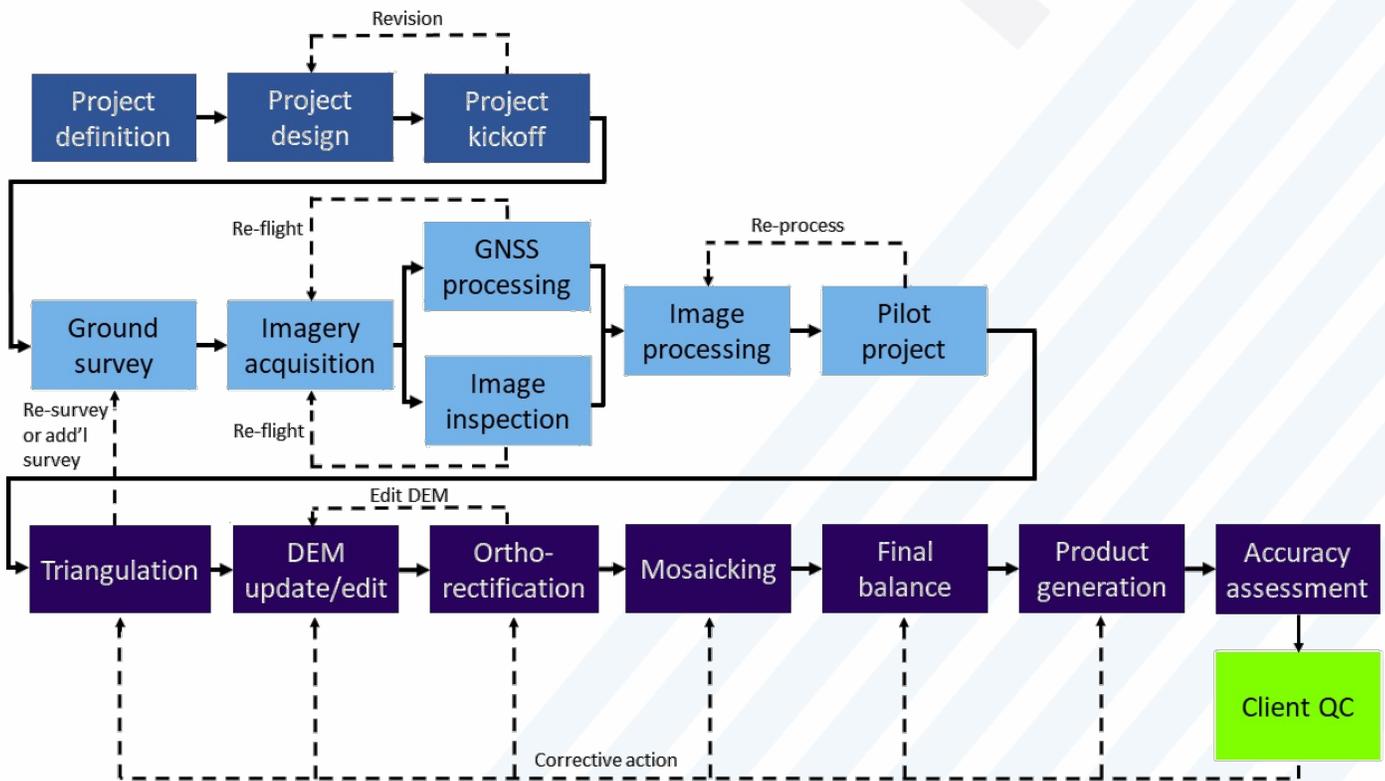
ADS100 imagery inspection interface



4) ORTHOIMAGERY PRODUCTION

The Surdex orthophoto workflow is best illustrated by the flowchart below followed by more detailed information on process steps.

Surdex's quality control system process overview



Triangulation

Since triangulation provides the foundation accuracy for the project, it involves checks and balances to ensure accurate results are provided to the production process to avoid costly and time-consuming re-work. The inputs to triangulation include GNSS+INS data, sensor boresight data, sensor calibration data, ground control and check point data, and the imagery itself.

The triangulation process involves the following steps:

- Automated measurement of pass and tie points appearing in the overlaps of the imagery.
- Interactive editing of pass and tie points.
- Measurement of control and check points.
- Bundle adjustment yielding refined imagery position, attitude and all point positions.
- If required, re-measurement of points and repetition of the adjustment.

The triangulation solution is based on a sophisticated bundle adjustment employing a mathematical model of the imaging geometry. It relies on the use of far more observations (observed/recorded values such as GNSS+INS, ground control, and image measurements) than are required for a unique solution. Using a least squares optimization approach, the observations are refined for a best fit. Careful inspection is made of the various residuals (differences between observed and adjusted values of parameters) reported by the solution.

Analysis of the quality of the triangulation solution is performed by a Certified Photogrammetrist who is highly skilled and experienced with the process. Upon completion of the triangulation process, the results are stored in the central database and published for use in the following production steps.

Elevation Model Preparation

Surdex will use the most current version of LiDAR available for orthorectification, supplemented with surface data produced off new imagery for creation of the Digital Elevation Model (DEM). If LiDAR is unavailable, after flight/triangulation when dense image matching is created, large elevated features (vegetation, buildings, etc.) are removed using a combination of automated and manual processes, with additional inspection. The master DEM is projected into the native projection and segmented into buffered extents of each accepted line segment for orthorectification in Surdex's distributed processing environment for file size efficiency of processing.

Orthorectification

Orthorectification will be performed using Leica XPro software, which operates in a highly distributed processing environment. All resampling is performed using bi-cubic resampling to ensure pixel location accuracy and to avoid aliasing effects commonly seen with nearest-neighbor or bilinear resampling techniques.

Radiometric Processing

Radiometric processing corrects defective pixels and adjusts the differing sensitivity of the pixels to a uniform result. It includes the application of all radiometric calibration information provided for each camera head from the supplier.

TECHNICAL PROPOSAL

Capital Area Council of Governments
Orthoimagery in the Capital Area (10 Counties)



Surdex limits sensor-specific processing to the front end of the production chain, and all imagery is retained in 4-band and 12 bpp (bits/pixel) format until the final tiles are produced. This allows us to make localized adjustments to color, tone, contrast, etc. without compromising the overall quality of the deliverable product.

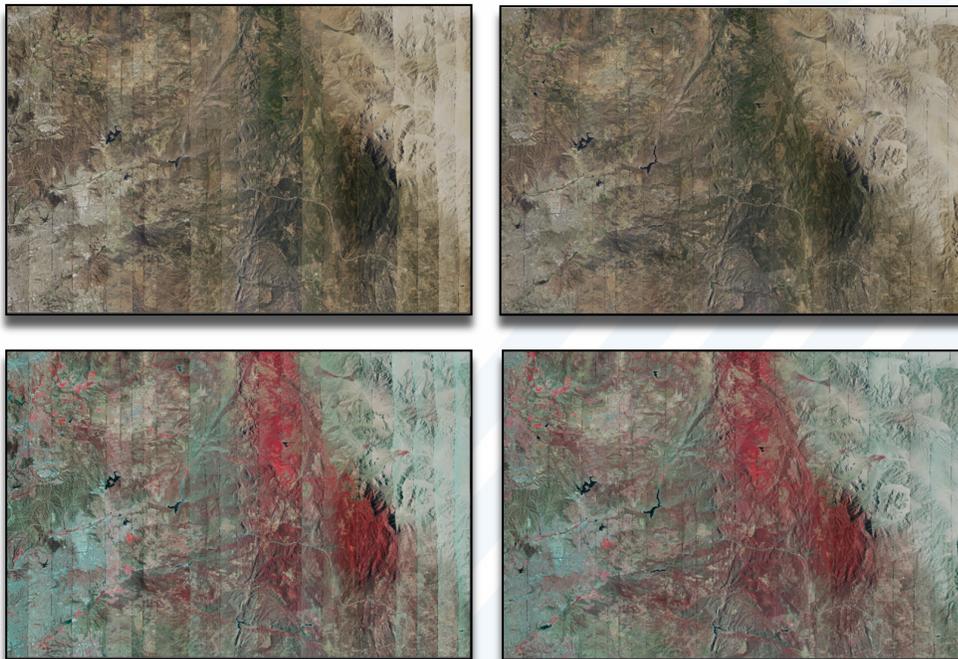
Using our own interface and database schema, image processing technicians organize large blocks of orthoimagery into groups with common characteristics, which do not necessarily coincide with individual flight missions. The tool can display images in ground space, allowing operators to see the relative image quality between neighboring images and imagery can be viewed in either color or CIR to ensure 4-band continuity. The atmospheric conditions during capture may result in imagery covering regions of differing degradation caused by haze.

Surdex's custom-developed Block and Global Balance software eliminates any residual issues evident after application of Bi-Directional Reflectance Distribution (BRDF) and atmospheric corrections. This is handled by two functions:

- **Block Balance** fits correction models to each strip of images with a single simultaneous bundle adjustment.
- **Global Balance** is then run to correct local differences in illumination between strips, and the results can be previewed in Group Tool without the need to generate intermediate files.

Global Balance uses a "rigid body model" correction calculated for each orthoimage that best forms a normalized block fitting neighboring orthoimages.

Before and after global balancing for RGB and CIR



Infrared Processing

Surdex's image processing approach supports 4-band (R-G-B-NIR), color (R-G-B), and color infrared (CIR: NIR-R-G) products by retaining imagery in 4-band x 12 bpp form until generation of the final deliverables. Since the red and green bands are common to the color and CIR renditions within a 4-band file, care must be taken to ensure proper appearance of both. In general, this is accomplished by limiting changes to the NIR band as much as possible. The approach is to first lock down the color rendition (ordered R-G-B or bands 1-2-3) and then process the NIR band to achieve the CIR rendition (ordered NIR-R-G or bands 4-1-2).

Seamline Generation Process to Create Mosaics

There are three steps in the seamline process:

- Automatic generation of seamlines
- Editing of seamlines from within Group Tool
- Application of the seamlines to create the Master Tiles

After all imagery in a completed triangulation block is orthorectified, automatic seams are generated, and then technicians must review the results and correct, if necessary, prior to writing out the Master Tiles. Once an area of seams has been accepted, the user selects tiles to be generated and adds them to a distributed processing queue.

Surdex's custom ray trace module is used to detect potential occlusions and smearing that may occur in rugged terrain. This software creates a graphical overlay that directs technicians to examine pixels that may be incorrect, avoiding the manual task of inspecting imagery for such issues. If an occluded or smeared area is encountered, the corresponding imagery from an overlapping orthoimage is inserted to replace it during the mosaicking process.

Surdex will supply an ESRI shapefile that fully delineates the seamlines used to merge overlapping digital orthoimages during the mosaicking process. Surdex's custom software automatically generates the seamline data during production, made possible by the integration of automatic seamline generation and manual edit into a single application and interface.

After mosaicking, imagery is produced to an internal tile layout that encompasses the project area with adequate buffering. Master Tiles are 8,192 x 8,192 pixels in size, in 4-band x 12bit format, and in the dominant reference frame of the project. Once the Master Tiles are completed, they are used to generate all delivery tile layouts, a process that includes re-projection into final datum and re-mapping to the 8-bit depth for final product.

Bodies of Water in Imagery

Surdex attempts to avoid seamlines crossing water bodies where possible; however, it is possible that passing seamlines through some water bodies cannot be avoided. Tonal variations will be apparent due to several factors, including sun angle changes during acquisition, turbidity changes caused by rainfall and runoff and naturally changing water “color.” In extreme cases, Surdex has developed processes to drastically improve the quality of the water and to reduce the severity of the spectral reflectance. Surdex will minimize the reflectance effect by patching in alternate views of the affected area from overlapping adjacent image data (either from within a line or an adjacent line). Should these alternative views not be available or are themselves affected by specular reflection, Surdex has also implemented a function to fill from surrounding areas.

Before (left) and after (right) extensive correction for specular reflection



The ADS100 lends itself to better treatment of objectionable artifacts stemming from effects such as specular reflection, wind chop, and the like involving bodies of water. Since this sensor has continuous acquisition of forward and backward imagery through arrays mounted approximately 25.6° (forward) and 19.4° (backward) relative to the nadir array, it can provide alternative views. Specular reflection and similar problems are caused by the relative angle between viewing and the sun location, and these two additional arrays provide alternatives to the nadir array.

During image inspection, the nadir array is evaluated for specular reflection and each affected image/strip annotated in our central database. This same database also tracks the sun angle and azimuth at the exact time of imaging, enabling the prediction of specular reflection effects. If a nadir image is flagged for specular reflection, the ortho technician is alerted to the situation and will select an alternate view minimizing specular reflection. If a mission is flown into the direction of the sun, as an example, it is logical to assume that the forward and nadir arrays may be adversely affected by resulting specular reflections. However, the backward array is often unaffected because it is looking in the opposite direction, and this imagery can be used to limit/eliminate reflection.

Pilot Project

Shortly after orthoimagery production begins, Surdex will deliver a representative pilot area of >10% of the project area to the Capital Area Council of Governments. The intent of the pilot is to define the desired appearance of the orthoimagery prior to full-up processing and to check form and format of the deliverables. The initial orthoimages will be processed to image metrics defined by the SOW (contrast, clipping, brightness, tone, etc.) and provided to the Capital area Council of Governments for review.

The pilot project will consist of:

- An area greater than 10% of the size of the AOI
- At least four uncompressed orthoimage tiles

Assessment of image quality includes several factors, some of which are objective (i.e.: computed) and some of which are still of a subjective nature. When discussing the image metrics presented in this section, one must keep in mind that they are guidelines and must be applied – or modified – to fit the context of the project. For example, image metrics will provide deceiving results if gathered from an image covering barren ground, water, desert, etc. The key factors in image quality are:

- “Colorimetry” – the balance of colors
- Contrast, tone, balance
- Clipping of dynamic range
- Sharpness
- Noise

Surdex software compiles image metrics on all images processed and retains them in a central database.

Metadata

Surdex is completely familiar with metadata delivery requirements having had this standard delivery for nearly all of our projects, including numerous projects in Texas. Surdex will provide fully compliant FGDC metadata for all data deliveries.

Horizontal Accuracy

As discussed in the project methodology text regarding project design, Surdex will incorporate industry, manufacturer, and empirical experience for acquisition parameters, establish sufficient ground control and take full advantage of available lidar data to meet required accuracies. Surdex understands and will fully comply with the accuracy specifications as detailed in the RFP and shown in the following table.

HORIZONTAL ACCURACY STANDARDS (INCHES)

ACCURACY CLASS	PIXEL SIZE	RMSE _{xy}	RMSE _r	ACCURACY, 95% CONFIDENCE	MOSAIC SEAMLINE MAXIMUM MISMATCH
ASPRS RECOMMENDED USE: "STANDARD MAPPING AND GIS WORK"	12.00	24.00	33.94	58.74	48.00

Preliminary Orthoimagery

With years of web services hosting experience on the USDA National Agriculture Imagery Program (NAIP) and with our web-based inspection tool, Surdex is in the unique position to offer clients a web-based imagery preview service. This service provides a visualization of acquisition progress and allows clients to assess whether ground and atmospheric conditions for acquisition were appropriate. This display of production imagery is superior to textual reports and progress graphics for many users and is accessible on desktop workstations as well as on most smartphones and tablets.

The service can be implemented with username/password authentication to control access, or it can be implemented as an open-access service to the public. If desired, the interim imagery can also be incrementally updated with the final imagery as production progresses, maturing into the final imagery service at the completion of the project.

Preview orthoimagery is automatically processed to default imagery metrics, suitable for assessing ground conditions, cloud/cloud shadow cover, flooding, snow/ice, fog, smoke, etc. If re-flights are conducted, their result will overwrite any previous imagery, resulting in a view of the most current data. Surdex can post preview imagery within two weeks of completion of acquisition.

INTERIM IMAGERY VERSUS FINAL IMAGERY

ITEM	INTERIM	FINAL PRODUCT
TRIANGULATION	None performed; based solely on trajectory processing	Triangulation supported by GNSS+INS, ground control
ORTHORECTIFICATION	To either existing (unedited) elevation surface or USGS NED	To final (edited) elevation surface
ACCURACY	Generally, 2-4X less accurate than final product	To product specifications
IMAGE PROCESSING	BRDF and atmospheric corrections applied; default processing to basic metrics/appearance	Additional processing to desired final product appearance
MOSAICKING	SEAMLINES	Automated with manual editing to final product specifications
	BALANCING	Block and global balance to final product specifications

TECHNICAL PROPOSAL

Capital Area Council of Governments
Orthoimagery in the Capital Area (10 Counties)



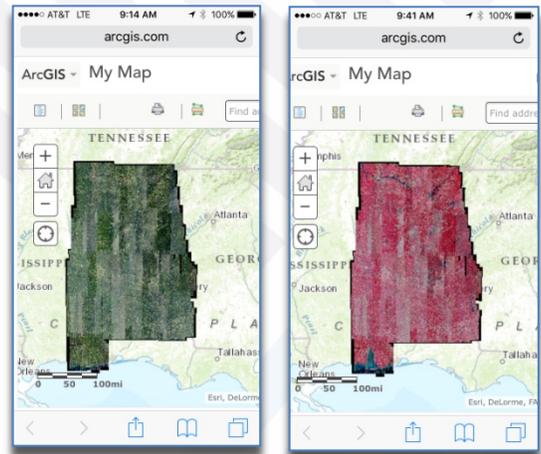
We believe this approach will yield orthoimagery that will allow the Capital Area Councils of Governments to determine whether the imagery was acquired under the correct ground and atmospheric conditions.

Surdex is willing to host this imagery to a web image service for use by the Capital Area Council of Governments. This service is essentially the same approach as the image service underlying our web-based inspection tool, SurCheck, and will persist until all production imagery is finalized. This can be implemented as a username/password solution to control access or implemented as fully open access. Since this is an imagery service, it can be accessed easily as a Java application without a geospatial context, used in any common GIS package, and even accessed by smart phones, tablets, etc.

The interim imagery web service is an OGC-compliant WMS implementation:

NAIP Early Access Image Service on iPhone

- 4-band imagery viewable as natural color or color infrared (CIR).
- A vector overlay portrays the image bounds complete with acquisition time/date, aircraft tail number, camera make/model/serial number, etc.
- It is a REST (REpresentational State Transfer) service that can be viewed by a user in several ways, including but not limited to:
 - As an ArcGIS Java viewer for simple viewing
 - Within ESRI ArcMAP
 - Within ESRI ArcGIS.com
 - Google Earth





B. QUALITY CONTROL WORKFLOW

Our redundant quality control processes require inspection at every major production phase, assuring that no work proceeds to the next step until it is validated against project specifications and image quality standards. The result is a 98% first time client acceptance rate.

Surdex has instituted extensive quality assurance (QA) and quality control (QC) procedures, modeled upon ISO processes, to provide premium quality products “first time right, on time.”

Our ISO processes continuously optimize quality control and efficiency. Surdex’s personnel have extensive experience that supports the quality control system, and our staff includes multiple Registered Land Surveyors (RLS) and several Certified Photogrammetrists.

QUALITY CONTROL SYSTEM FOR ORTHOIMAGERY PRODUCTION	
FEATURE	BENEFIT
Use of Certified Photogrammetrists and Registered Land Surveyors at key steps in the process	<ul style="list-style-type: none"> Ensures quality and accuracy
100% image inspection – each and every raw image is reviewed, graded, and results retained in a central database	<ul style="list-style-type: none"> Ensures acquisition is completed and reviewed in a timely manner Ensures image quality
Staff mark data as ready for the next step	<ul style="list-style-type: none"> Ensures inputs are fully processed for each step
Use of custom-developed software at key steps	<ul style="list-style-type: none"> Not reliant upon 3rd party solutions Quickly develop solutions to address problems that arise
Independent accuracy validation reporting	<ul style="list-style-type: none"> Objective results and reporting, can be duplicated by the client
Custom software to generate seamline shapefiles	<ul style="list-style-type: none"> Enables clients to inspect the predominant source of residual artifacts
Web-based inspection tool with call-outs and response retained in the central database	<ul style="list-style-type: none"> Streamlines inspection, acceptance, and delivery Complete record of all inspection and remedial actions

TECHNICAL PROPOSAL

Capital Area Council of Governments
Orthoimagery in the Capital Area (10 Counties)



QUALITY CONTROL FOR ORTHOIMAGERY PRODUCTION

PHASE	APPROACH
PROJECT DESIGN	<ul style="list-style-type: none">• Internal design reviewed by project manager, Certified Photogrammetrist, and Registered Land Surveyor• Reviewed by client
GROUND SURVEY OPERATIONS	<ul style="list-style-type: none">• Field survey operations and processing under the supervision and review of a Registered Land Surveyor
IMAGERY ACQUISITION	<ul style="list-style-type: none">• Aircraft inspection, maintenance, and repair performed prior to and during project• Sensor calibrations updated as needed• Boreighting of sensors prior to use and/or after installation/re-installation• Reporting of detailed progress by each aircrew at end of acquisition day• Nightly updating of flight plans incorporating acquisition and results of inspection
IMAGERY INSPECTION	<ul style="list-style-type: none">• Each image graded and reported in central database, including inspection against the following factors, at a minimum:<ul style="list-style-type: none">• Seasonal window(s) and client start/stop work orders• Sun angle and/or timeframe specifications• Project specifications for ground conditions (flooding, smoke, haze, etc.)• GNSS+INS accuracy and quality• Camera misfires• Image motion/smear• Agreement with flight plans• Clouds/cloud shadows• Specular reflection noted for technicians to correct• Automated analysis of smear and/or occlusion in rugged terrain executed for use by technicians
TRIANGULATION	<ul style="list-style-type: none">• Trajectory processing reviewed by a Certified Photogrammetrist / Registered Land Surveyor• Tailored triangulation reports for client review• Dependent upon accuracy requirements, graded against:<ul style="list-style-type: none">• Ground control, GNSS+INS, and image residuals• Agreement with checkpoints• Distribution and placement of pass/tie points in final solution
ELEVATION MODELING	<ul style="list-style-type: none">• Visual review• Comparison of triangulation points to the elevation surface to determine areas of change or problems
ORTHO/MOSAIC	<ul style="list-style-type: none">• Ortho technicians inspect one another's work and perform edits• Depending upon resolution of imagery, planimetric data such as roads, bridges, rail lines, buildings, etc. may be used to focus guide seamline review/edit
PRODUCT QC	<ul style="list-style-type: none">• Use of Pilot Project(s) with client to assess:<ul style="list-style-type: none">• Color, tone, balance specifications/expectations of client• Form/format of deliverables• Metadata compliance• Accuracy analysis performed using Esri ArcGIS and Excel

Project Planning

Project planning involves design of the imagery acquisition and control survey network which ensures accuracy requirements are met and guarantees total product coverage.

Flight plans are generally developed by Surdex's flight acquisition manager and are approved by the project manager, a Certified Photogrammetrist. When the flight plans are approved, the Triangulation and Survey staff design the ground control network against the flight plans. A Certified Photogrammetrist from Triangulation and a Registered Land Surveyor from Survey are responsible for the design. The design is approved by the project manager.

Ground Survey

Ground survey is performed by a Registered Land Surveyor (RLS) or technicians under the direct supervision of an RLS. All calculations are performed by an RLS and reviewed by a Certified Photogrammetrist from the Triangulation staff.

Sensor Calibration

Prior to use on a project, Triangulation personnel review all sensor calibration information to ensure all systems are up-to-date. The following is also prepared for each aircraft/camera combination prior to use in processing:

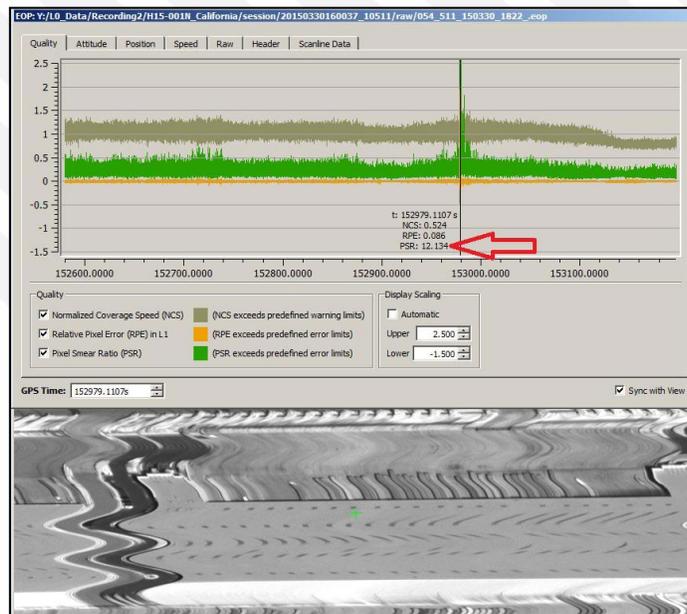
- GNSS antennas
- Dual-frequency receivers
- Surveys accurately portraying the relationship between the camera lens nodal point and the antennas
- Radiometric and geometric calibration files for each sensor

Image Inspection

Surdex employs 100% inspection, reviewing and grading all imagery and updating the central database with the results. If re-flights are isolated, they are immediately prioritized to the acquisition aircrews. Should any question arise about the quality of the imagery or adherence to project specifications, Surdex's project manager will consult with the client on the proper course of action.

With any type of aerial digital sensor, care must be taken to inspect imagery for possible image blur caused by turbulence. In late 2014, Leica supplied Surdex with a basic software tool that aids in locating areas of potential blur. Surdex built upon this tool with customized software to better integrate it into the imagery inspection task. In addition, Surdex's aircrews were trained on the effects of turbulence and we instituted flight reports that quantify any turbulence, allowing us to focus our imagery inspection to isolate and prioritize potential re-flights.

Leica/Surdex blur tool used during inspection, showing potential blur graph and corresponding image blur



Triangulation

Surdex employs numerous checks throughout the critical triangulation phase. These include, but are not limited to:

- Each triangulation block is independently reviewed by a Certified Photogrammetrist not involved in the specific block under review.
- Surveyed checkpoints are carried through the triangulation process as “floating” points (not constrained to their known positions), and these points are checked against the known (surveyed) positions.
- All residuals (sensor position, ground control points, image points) are inspected to ensure they are within the respective estimated precision of each.
- All triangulation points (pass, tie, control) are checked against the existing DEM data to search for obvious disjoints. This is sometimes helpful in finding errors in datums, projections, etc. associated with both the triangulation and the DEM.

Orthorectification and Mosaicking

Technicians review the orthoimagery for:

- Seamless appearance (against seamline shapefiles)
- Image processing artifacts
- Overall color balance against the target appearance from the pilot project

C. CONTINGENCY PLAN

Contingency plans are implicit in the formal operation within Surdex. While we cannot control weather conditions, we can, and do, ensure more than the minimum acquisition and support resources. Some of the steps we take to ensure successful execution include:

- With up to five acquisition platforms, we will not hesitate to bring in an additional aircraft during good weather and/or access to difficult airspaces.
- Surdex has FAA-certified inspection, maintenance, and repair staff, independent of third-party support. This ensures maximum productivity for our aircraft and minimal reliance on the schedules of others.
- Surdex employs extensive cross-training of production technicians to address bursts of work or delays in schedule. For example:
 - Triangulation staff is supported by stereo compilation staff for the measurement and edit of points. Numerous Certified Photogrammetrists are also available to perform triangulation solutions and/or review.
 - Image processing personnel are cross trained to handle orthorectification/mosaic tasks.
 - Orthorectification personnel can perform many image processing tasks and can aid in image inspection.
 - Finishing personnel perform independent review of orthoimage deliverables. Additionally, these technicians are trained to perform DEM/LiDAR editing to back up the compilation staff.
 - For the typical summertime burst of production, part-time employees have been hired to handle limited and focused ortho/mosaic tasks on an as-needed basis.
 - Project managers and supervisors are experienced in technical work and can support bursts of demand if required.
- Our computing and storage systems use redundant storage and a combination of automated and manual backup of data at critical junctures in the process. All backup data is stored in the hangar facility separate from the main office. Battery backups are employed to address power outages, allowing a safe shutdown of all servers and drives.
- All critical equipment and software are under maintenance agreements.
- Our production facility has a diesel-powered generator that can be re-fueled indefinitely, ensuring production is not affected in the instance of a power failure.
- If weather conditions prohibit use of certain airports, we can re-locate our aircraft to other airports.
- We have several acquisition subcontractors from our USACE, GPSC, and USDA work available to assist in acquisition if necessary.

D. LOCALIZED AND UNIQUE ISSUES

With years of experience capturing imagery in the State of Texas, Surdex has gained valuable insight relating to the proper process for imagery acquisition in the state. Surdex has worked for TNRIS and the Houston-Galveston Area Council on numerous projects, and over the course of this work we have dealt with border access issues, coastal area weather, and snow cover in the East Texas Upland area during the main acquisition window. Surdex was also awarded a contract in 2014 to acquire 50 cm GSD orthoimagery of the entire state. We have become very familiar with localized and unique issues across Texas. Surdex's successful completion of the CAPCOG 2020 and 2021 orthoimagery project and prior projects with Brazos County in 2015, 2017 and 2021 is evidence we understand localized and unique issues.

E. PRODUCTION CENTERS AND ASSOCIATED WORK

Our headquarters and production facility are based in the greater metropolitan St. Louis, Missouri area. Approximately 100 employees work at our headquarters building and hangar complex at the Spirit of St. Louis Airport in Chesterfield, Missouri.

Surdex believes that there is no substitute for experience. Our workers' experience on numerous projects in Texas, including a statewide project, resolving difficulties and streamlining processes enables them to apply their knowledge on your project, saving time, avoiding potential problems, and improving quality.

Surdex's staff consists of highly qualified, highly trained personnel. Our senior staff averages over 25 years of experience. We have 8 ASPRS Certified Photogrammetrists, 1 ASPRS Certified Mapping Scientist – Lidar, 1 GISP certification, 2 Registered Land Surveyors and 1 Project Management Professional (PMP) certification. Many of our staff have degrees in mapping or engineering fields. With this depth of experience, our senior staff understands how to analyze projects, develop the best approaches, avoid potential problems, and quickly resolve them if they do arise.

Surdex's aircraft are housed in our 18,000 square foot hangar at Spirit of St. Louis Airport, only blocks from Surdex's headquarters in the St. Louis area. Surdex's full-time aircraft maintenance staff is certified for A&P (Aircraft and Powerplant) with Inspection Authorization (IA) to support our fleet. This staff is qualified and licensed to perform FAA-mandated inspections, maintenance, and repair. We are therefore not reliant on the schedules and costs of third parties. We have even transported maintenance personnel to project areas to perform inspection, maintenance, or repair in the field.

Surdex's 17,000 square foot headquarters and production facility (left) and 18,000 square foot hangar on the Spirit of St. Louis Airport grounds (right)



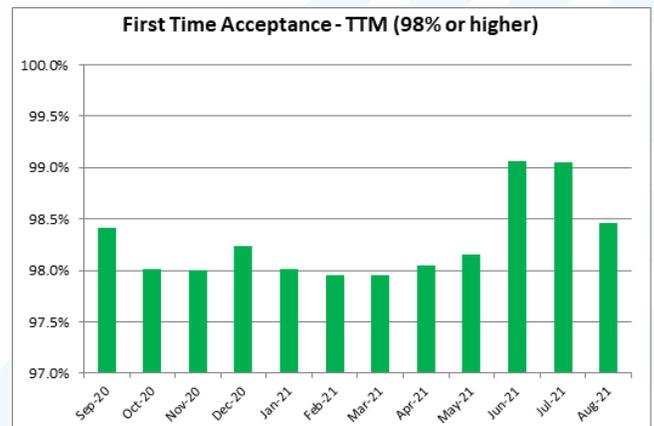
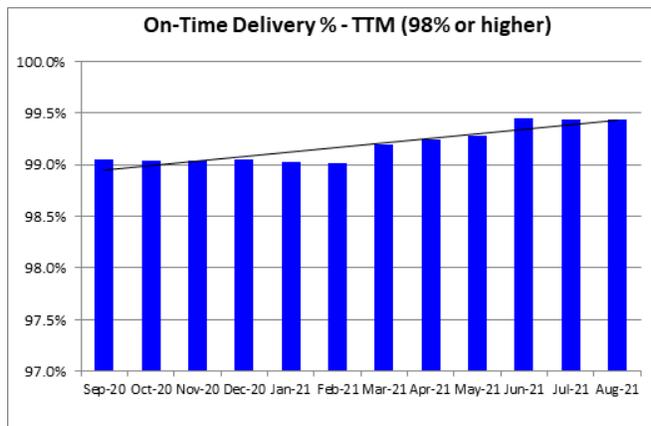


F. COMMITMENT OF RESOURCES

- Mr. Cornell Rowan, ASPRS Certified Photogrammetrist, will be assigned as the dedicated project manager. Cornell managed the 2020 and 2021 orthoimagery project for the Texas Capitol Area Council of Governments as well as numerous other Texas projects including the 2012 South Texas Project, several Smith County and Houston-Galveston Area Council projects, and the 2014 Texas Statewide Program. His previous experience will prove invaluable to the successful completion of this project.
- Cornell has worked with up to 21 partners on a single project, so he will easily be able to work with Capital Area Council of Governments and make sure all needs are met.
- For the acquisition phase, we will have up to five aerial acquisition platforms. Each includes a Conquest or Commander hosting an ADS100 sensor.
- Surdex will provide the necessary ground surveying resources for field operations and office processing.
- Surdex commits the necessary production resources for image processing, triangulation, ortho/mosaic steps, project QC, and product delivery.
- The Surdex web-based SurCheck inspection tool is offered free of charge for the Capital Area Council of Governments for orthoimagery inspection.

G. PAST PERFORMANCE

The graphs below demonstrate the internal focus Surdex places on timely delivery of high-quality geospatial products that we will apply to the Orthoimagery in the Texas Capital Area project as well.



Detailed descriptions of a few of our completed projects are included in the following pages. Your assigned project manager, Cornell Rowan, managed the H-GAC and CAPCOG projects.

TECHNICAL PROPOSAL

Capital Area Council of Governments
Orthoimagery in the Capital Area (10 Counties)



H-GAC IMAGERY

	DETAILS	PROJECT NARRATIVE
CLIENT	Houston-Galveston Area Council (H-GAC)	<p>Surdex Corporation was contracted by the Houston-Galveston Area Council (H-GAC) to acquire aerial imagery for several different projects through a competitive bidding process, most recently in 2020. Particular attention was paid to multiple tall building areas around the City of Houston, requiring additional flight lines to reduce the amount of building lean in the final products. For this project, Surdex utilized the existing LiDAR DEM datasets for the orthorectification process.</p> <p>Surdex also acquired post-Hurricane Harvey flooding imagery for H-GAC in 2017.</p>
CONTACT PERSON	Tanya Nguyen Director of Data Services (713) 993-4569 tanya.nguyen@h-gac.com	
ADDRESS	Houston-Galveston Area Council 3555 Timmons Lane Houston, TX 77027	
END DATES	August 2020, October 2018, February 2018, August 2016, January 2015, December 2012	
SUBCONTRACTORS	InMASS (ground survey)	

ACQUISITION SUMMARY

YEAR	GSD	≈ SQ. MI.
2020	12"	6,068
	6"	7,393
2018	12"	6,068
	6"	7,393
2017	12"	10,322
2016	6"	7,090
2014-2015	12"	6,630
	6"	7,400
	3"	68
2012	12"	13,906
	6"	1,334
	3"	12

PROJECT DELIVERABLES	<ul style="list-style-type: none"> • 12"/6"/3" 4-band digital orthoimagery processed to separate RGB and CIR GeoTIFFs • Web imagery viewing service for approximately 50 participants (2020) • MrSID mosaics (2014, 2016 & 2018) • Seamline shapefile • FGDC metadata
HIGHLIGHTS	<ul style="list-style-type: none"> • Acquiring imagery for optimal ground conditions prior to onset of rain • Deliveries on or ahead of schedule • Achieving proper color balance over extensive areas of water

TECHNICAL PROPOSAL

Capital Area Council of Governments
Orthoimagery in the Capital Area (10 Counties)



DISTRICTWIDE ORTHOIMAGERY

	DETAILS	PROJECT NARRATIVE
CLIENT	Southwest Florida Water Management District (SWFWMD)	<p>Surdex was contracted to provide orthoimagery for the Southwest Florida Water Management District (SWFWMD) and additional project partners in 2017 and in 2020. Because this project included numerous participants with varied requirements and needs, communication among participants and coordination were key to the successful completion of the project. Imagery was collected with a Leica ADS100 digital image sensor, processed and delivered as 6" GSD 4-band digital orthoimagery.</p> <ul style="list-style-type: none"> SWFWMD's core project area included all or part of 14 counties: Levy, Marion, Citrus, Sumter, Hernando, Lake, Pasco, Hillsborough, Polk, Pinellas, Manatee, Sarasota, Charlotte and Highlands. The Florida Department of Revenue contracted for two additional counties (DeSoto County and Hardee County). Three counties partially outside the District boundary joined the project as add-ons (Polk County, Charlotte County and Marion County).
CONTACT	Nicole Hewitt, GIS Analyst (352) 796-7211 ext. 4393 Nicole.Hewitt@swfwmd.state.fl.us	
ADDRESS	Data Collection Bureau 2379 Broad Street Brooksville, FL 34604	
END DATES	September 2020, October 2017	
SUBCONTRACTORS	None	

ACQUISITION SUMMARY

YEAR	GSD	SQ. MI.
2020	6"	12,651
2017	6"	11,479

PROJECT DELIVERABLES	<ul style="list-style-type: none"> 6" GSD 4-band digital orthoimagery in uncompressed GeoTIFF format Separate delivery of Hardee and DeSoto counties to FDOR, including metadata and seamlines MrSID mosaic for Lakeland area (2017) DEM used for ortho generation in LAS 1.4 PDRF 6 with associated metadata in WKT Metadata files for each tile, seamlines, DEM and project wide (four formats)
HIGHLIGHTS	<ul style="list-style-type: none"> Small flight window—mid-December through end of February

TECHNICAL PROPOSAL

Capital Area Council of Governments
Orthoimagery in the Capital Area (10 Counties)



ORTHOIMAGERY IN THE TEXAS CAPITAL AREA

	DETAILS	PROJECT NARRATIVE
CLIENT	Capital Area Council of Governments (CAPCOG)	Surdex was contracted to provide orthoimagery at three different resolutions for an area totaling approximately 14,600 square miles in the capital area of Texas and McLennan County. The project was run through the Texas Water Development Board and included several project partners including the Capital Area Council of Governments, several different municipalities, McLennan County and McLennan County 911. Surdex carefully designed the acquisition and prepared the final deliverables in a manner that incorporated the requirements from each project partner.
CONTACT	Nikolas Puillas, GIS Operations Coordinator CAPCOG (512) 916-6171 npuillas@capcog.org	
ADDRESS	6800 Burleson Road Building 310, Suite 165 Austin, TX 78744	
END DATES	July 2020 and July 2021	
SUBCONTRACTORS	None	

ACQUISITION SUMMARY

YEAR	GSD	SQ. MI.
2021	12"	7,389
	12"	12,296
2020	6"	2,286
	3"	12

PROJECT DELIVERABLES	<ul style="list-style-type: none"> • 4-band uncompressed GeoTIFF tiles (with TFW) • JPEG2000, ECW and MrSID compressed tiles • JPEG2000, ECW and MrSID mosaics
HIGHLIGHTS	<ul style="list-style-type: none"> • Project plan addressed 3 different resolutions and tall building areas • Surdex provided deliverables in various formats and projections per each participant's specifications

H. SURDEX'S WEB-BASED INSPECTION TOOL (SURCHECKSM)

To assist our clients with the inspection of their orthoimagery, Surdex provides – *at no additional cost* – our web-based image inspection tool, SurCheck. This tool is the result of years of continuous improvement and responses to user requests for enhancement. It is implemented in HTML5, JavaScript, php, and the ArcGIS API for JavaScript, providing flexibility for enhancements in the future.

SurCheck streamlines the inspection, remedial action, and delivery timelines. As call-outs are reported by reviewers, Surdex resolves each and notifies reviewers so they may confirm the correction. When all call-outs are resolved for the project, the data can be shipped for final delivery. In many cases, clients choose to have orthoimagery added to SurCheck incrementally, further expediting inspection and allowing leveling of inspection resources.

SURCHECKSM

FEATURE	BENEFIT
ADMINISTRATIVE	
Username and password login access	Protected access
Client manager can assign reviewers to separate work zones within a project	Ability for multiple reviewers increases inspection rate, supports multiple partners
Four tiers of reviewers: <ul style="list-style-type: none"> • Standard inspector • Client manager • Surdex reviewer • Final client reviewer 	Covers entire lifecycle of inspection and resolution process, ensuring product is fully inspected and accepted
Help menu for most options	Online assistance with operation eliminates the need for a training guide, allowing inspection sessions to continue uninterrupted
GENERAL INTERFACE	
Browser-based	Works on any computer without the need to install software
Simple one-page design	Simple interface makes training easy, maximizes screen real estate for viewing imagery
Surdex-provided overlay of seamlines	Assists in searches for potential artifacts
Swipe function with user-selectable layer	Provides a quick comparison to other imagery
Ability for users to add their own map layers	Enables use of desired datasets for comparison—examples include historical imagery, vector overlays, control point overlays, parcels, ArcGIS Online layers, etc.
Magnifier window	Quick toggling between magnifier and standard view allows reviewers to retain scale with close-up inspection of potential artifacts
Histogram	Aids in determining adherence to project-specific image metrics
Progressive inspection	Methodical approach streamlines inspection and portrays status
Save call-outs to a shapefile or CSV files	Export call-outs for non-SurCheck users for review (can view in other applications i.e. Esri ArcMap, AutoCAD); CSV easily imported into Excel
Measurement tool	Supports investigation of call-outs against specifications (such as seamline shear, size of artifact, etc.)
Print current screen to printer or PDF	Simplifies creation of samples, bug reporting, etc.

Upon request, Surdex can provide a video and PowerPoint presentation to familiarize and train users on the tool's use, as well as access to a sample project.

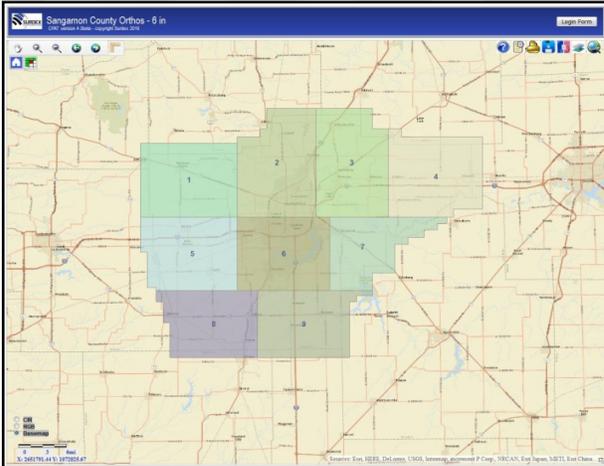
The following page portrays selected aspects of SurCheck.

TECHNICAL PROPOSAL

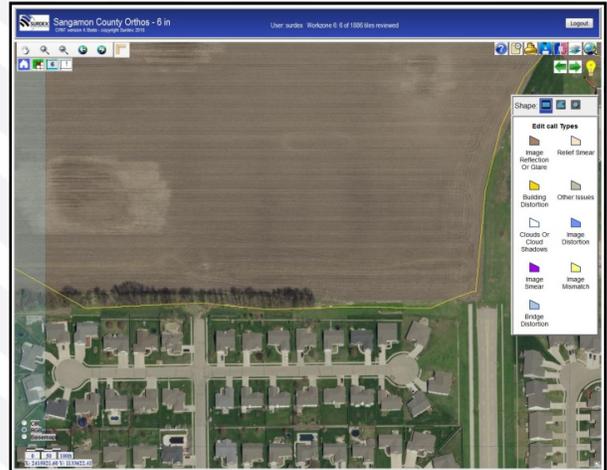
Capital Area Council of Governments
Orthoimagery in the Capital Area (10 Counties)



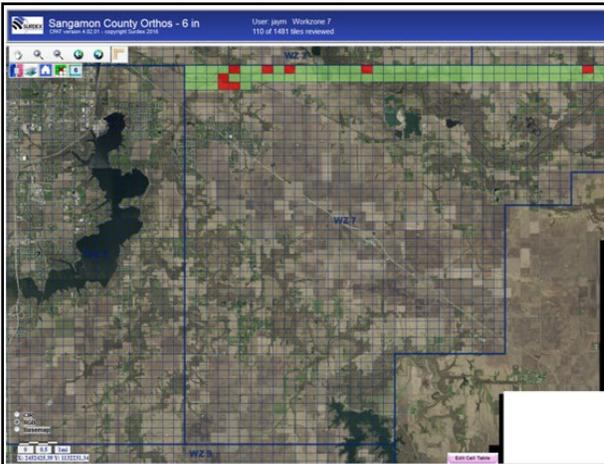
Initial screen showing AOIs



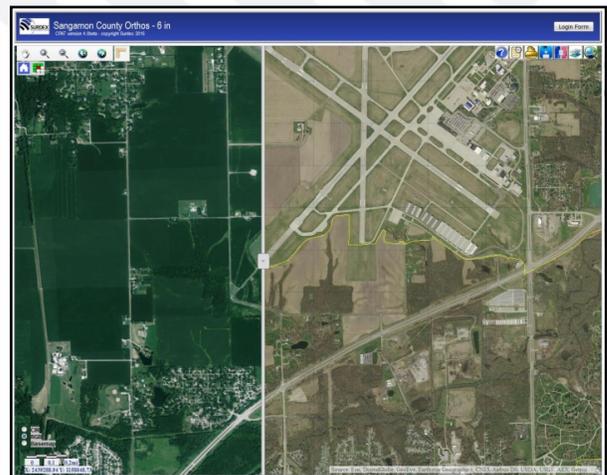
Call-out template



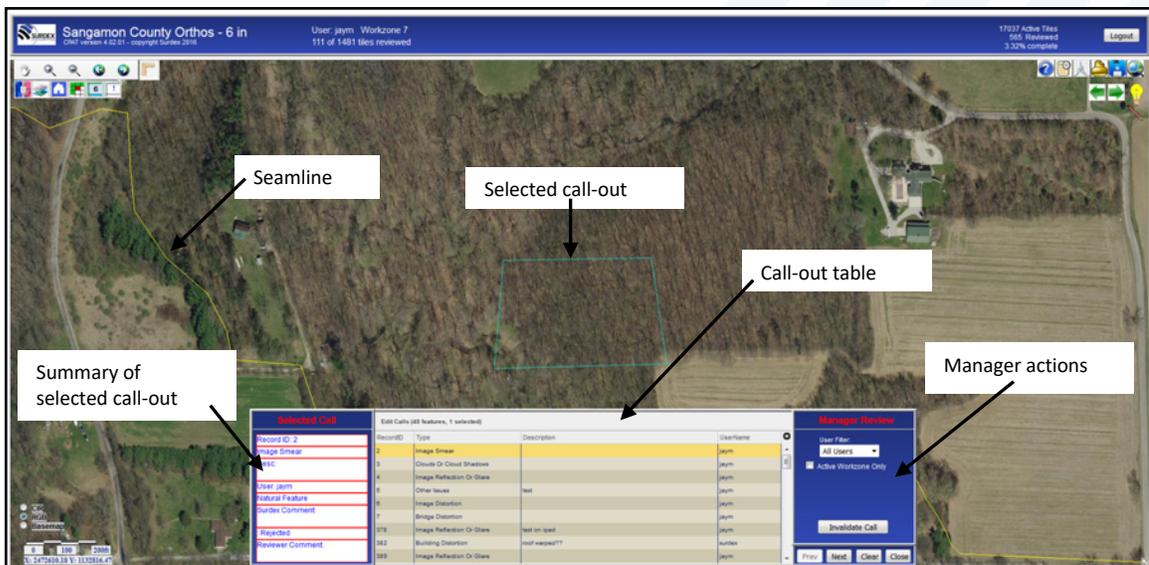
Work zone progress



Swipe between color and ArcGIS.com imagery



Manager call-out review





I. COMMUNICATION

1) REPORTING

Surdex understands the importance of regular communication throughout an orthoimagery project. Project Manager Cornell Rowan will attend the kick-off meeting as well as all subsequent meetings with the Capital Area Council of Governments and provide the necessary reports. Key production staff will also attend the kick-off meeting. The reporting plans are detailed in the table below.

SUMMARY OF REPORTING PLANS FOR THE PROJECT	
KICK-OFF MEETING	<p>To be scheduled with Capital Area Council of Governments after project scope is finalized. Proposed agenda includes:</p> <ul style="list-style-type: none"> • Identify points of contact for all aspects of project • Review scope and specifications • Discuss project design (flight and ground survey) presented by Surdex prior to meeting • Provide sensor calibration reports • Finalize invoice schedule and payment proportions
SUBSEQUENT MEETINGS	<p>Surdex is willing to meet with the Capital Area Council of Governments at any time to address specific issues and/or progress</p>
REPORT ON MOBILIZATION	<p>Surdex will appraise and discuss with the Capital Area Council of Governments of plans to mobilize to/from the project area on an as-needed basis</p>
AQCQUISITION PROGRESS	<ul style="list-style-type: none"> • Daily updates provided via real-time status graphics and reports during acquisition • Available for weekly telecons/webcast at the request of the Capital Area Council of Governments.
POST-PROCESSING	
DELIVERY OF PRODUCTS AND PERCENTAGE OF COMPLETION OF PROJECT PHASES	

2) PROJECT MANAGEMENT

Mr. Cornell Rowan will be the project manager and serve as the primary point of contact to your designated representative(s) at all times. Cornell has extensive experience managing projects in Texas, so he is very familiar with the project area and the specific concerns of the Capital Area Council of Governments. He has 37 years of professional experience in the field has been with Surdex for 13 years, and he is a Certified Photogrammetrist. Cornell reports to the Director of Project Management, Mr. Wade Williams, who is also a Certified Photogrammetrist.

Surdex’s project management approach is founded on frequent communication. Each of our project managers has experience in nearly all phases of production. They are guided by the philosophy that they must support the objectives of their clients by efficiently managing internal resources and maintaining schedules as well as quality and accuracy standards.

Communication can take the form of face-to-face meetings, e-mails, telephone calls, and webcasts. Our project managers are required to communicate with each of their clients at least once a week and must respond to a client’s communication within 24 hours of receipt. The following graphic is an example of the Project Overview section of a Project Status Report.

Sample Project Status Report illustrating percent of progress by phase and area

Project Overview						
Status by Phase						
Project Area	Survey	LiDAR Flown	LiDAR processed	Imagery Flown	Digital Orthos Produced	Plan/Topo Mapping
6 inch – West	100%	-	-	100%	0%	-
6 inch – East	100%	-	-	100%	N/A	-
12 inch	100%	-	-	100%	0%	-
Status by Task	100%	-	-	100%	0%	-
Legend	Not Started	In Progress	Complete	Issues/Concerns		

Each of our project managers is required to:

- Complete a Project Scope document that fully details the project specifications
- Conduct a client kickoff meeting to ask questions and arrive at a consensus on all project details—Surdex expects that client kickoff and closeout meetings will be conducted virtually for 2022 projects, but will attend in-person meetings if required
- Host internal meetings:
 - Kickoff meeting with department heads to review all project requirements, evaluate resources, and establish schedules
 - Weekly internal status meetings with all applicable department heads and senior management
 - Project close-out meeting that assesses our performance in detail and results in “lessons learned” to improve future performance
- Maintain information in our central database:
 - Weekly status updates of project schedules (external and internal)
 - QA/QC results to ensure quality expectations are met
 - Review project costs and generate invoices

Surdex tracks real-time status of acquisition design, acquisition progress, production steps and inspection results for both imagery and lidar to ensure projects remain on schedule. Acquisition progress is reported in our daily flight planning meeting via graphical and textual reports, as this is an extremely critical phase of the project. Raw data inspection occurs immediately after acquisition, and the database is updated with inspection results, triggering re-flights in a timely manner. This ensures that any re-flights occur as close to the original acquisition date as possible, minimizing differences from temporal changes.



J. PROJECT SCHEDULE

PROPOSED SCHEDULE		
TASK	START DATE	END DATE
PROJECT PLANNING / SURVEY CONTROL	December 15, 2021	January 15, 2022
IMAGERY ACQUISITION	January 1, 2022	February 28, 2022
AEROTRIANGULATION	February 16, 2022	March 15, 2022
ORTHO PRODUCTION	February 21, 2022	July 18, 2022
ORTHO PILOT	April 15, 2022	
ORTHOIMAGERY POSTED TO SURCHECK	June 30, 2022	
CLIENT REVIEW ON SURCHECK	July 1, 2022	July 20, 2022
ORTHO CORRECTIONS	July 21, 2022	July 28, 2022
ORTHO FINAL DELIVERABLES	July 28, 2022	

**Final Deliverables will include compressed 4-band mosaics for the Capital Area in JPEG2000 format.*

K. WARRANTY

Imagery is covered by warranty for two years after delivery.

Approved DIR Contractor

Surdex is an approved Texas DIR Contractor for Geospatial Products and Services: DIR-CPO-4496.



PRODUCT SAMPLES

Surdex has not included sample imagery with this proposal. The Capital Area Council of Governments has the data from our deliveries for the 2020 and 2021 projects.

PRICING

Orthoimagery Pricing Table			
Texas DIR Contract: DIR-CPO-4496 Discount Schedule			
Company Name:	Surdex Corporation		
Unit Cost Per 12-inch DO4Q*		DIR Discount	Unit Cost Per 12-inch DO4Q Tile* with DIR Discount**
<i>DO4Q Tiles:</i>	\$ 28.76	27%	\$ 21.00
12-inch = 8,840 DO4Q Tiles			
<i>GeoTIFF</i>			
<i>JPEG2000</i>			
Total Cost For Capital Area Mosaic*		DIR Discount	Total Cost for Capital Area Mosaic* with DIR Discount**
<i>Capital Area Mosaic:</i>	\$ 0.00	N/A	\$ 0.00
<i>JPEG2000</i>			
<i>*One unit cost to include all formats listed and mobilization fees.</i>			
<i>**Includes DIR 0.75% administrative fee</i>			

Data Hosting: \$7,945.00 for 12 months after final delivery: DIR Discount 27% - \$5,800.00 per year.

**CAPITAL AREA EMERGENCY COMMUNICATIONS DISTRICT
BOARD OF MANAGERS MEETING**

MEETING DATE: October 13, 2021

AGENDA ITEM: #7 Consider Approving 9-1-1 GIS Contracts

GENERAL DESCRIPTION OF ITEM:

Staff is seeking approval of 9-1-1 GIS contracts with local governments for 1/1/2022 – 9/30/2022. In July, the Board approved a 3-month extension of the existing FY 2021 contracts to cover the period in which counties were expected to transition to Next-Generation 9-1-1 (NG9-1-1) (i.e., by 12/31/2021). The new contracts include updates to the scope of work and data submission requirements based on new workflows and expectations for managing 9-1-1 GIS databases in a NG9-1-1 environment. The attached memo explains these changes.

Funding for these contracts represents 3/4 of the \$1,893,066.15 budgeted for the fiscal year, corresponding to the 9 of 12 months that it will cover. The amount was calculated based on the size of each local government’s database as of June 2021 and a funding formula approved by the board in early 2020. The other quarter is accounted for in the 3-month extension to the FY 2021 contracts currently in place.

THIS ITEM REPRESENTS A:

- New issue, project, or purchase
- Routine, regularly scheduled item
- Follow-up to a previously discussed item
- Special item requested by board member
- Other

PRIMARY CONTACT/STAFF MEMBER: **Andrew Hoekzema, Director of Regional Planning & Services**

BUDGETARY IMPACT:

Total estimated cost: \$1,419,799.60

Source of Funds: CAECD revenue

- | | | |
|---|---|--|
| Is item already included in fiscal year budget? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| Does item represent a new expenditure? | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No |
| Does item represent a pass-through purchase? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |

If so, for what city/county/etc.? Bastrop, Blanco, Burnet, Caldwell, Fayette, Hays, Lee, Llano, and Williamson Counties, and City of Austin.

PROCUREMENT: N/A

ACTION REQUESTED:

Approve Amendments to FY 2021 9-1-1 GIS Contracts

BACK-UP DOCUMENTS ATTACHED:

1. 9-1-1 GIS Local Government Contract Amendment Memo
2. FY 2022 ILA for 9-1-1 GIS Database Management
3. FY 2022 ILA Attachment A: Scope of Work
4. FY 2022 ILA Attachment B: CAPCOG NG9-1-1 GIS Data Requirements

BACK-UP DOCUMENTS NOT ATTACHED (to be sent prior to meeting or will be a handout at the meeting): None



BASTROP BLANCO BURNET CALDWELL FAYETTE HAYS LEE LLANO TRAVIS WILLIAMSON

MEMORANDUM
September 21, 2021

TO: CAECD Board of Managers

FROM: Andrew Hoekzema, Director of Regional Planning and Services

RE: FY 2022 Next-Generation 9-1-1 GIS Contracts

CAPCOG are requesting approval of 9-1-1 GIS contracts with City of Austin and Bastrop, Blanco, Burnet, Caldwell, Fayette, Hays, Lee, Llano, and Williamson Counties to support ongoing work to maintain and update GIS databases needed to ensure accurate and efficient routing of 9-1-1 calls and text messages and response to those calls. These contracts will cover work for the last nine months of the fiscal year, when the entire region is expected to be in a Next-Generation 9-1-1 (NG9-1-1) system. Funding amounts are based on a formula established by the board in February 2020¹ and the number of records in each local government’s databases as of June 2021. The funding for each local government is shown below.

Local Government	Database Records	FY 2022 Funding Amount	Q1 Amount (included in existing contract amendment)	Q2-Q4 Amount for New Contracts
Bastrop	60,173	\$141,198.95	\$35,299.74	\$105,899.21
Blanco	9,875	\$46,906.25	\$11,726.56	\$35,179.69
Burnet	42,673	\$121,073.95	\$30,268.49	\$90,805.46
Caldwell	23,822	\$99,395.30	\$24,848.83	\$74,546.47
Fayette	25,289	\$101,082.35	\$25,270.59	\$75,811.76
Hays	105,848	\$193,725.20	\$48,431.30	\$145,293.90
Lee	12,580	\$59,755.00	\$14,938.75	\$44,816.25
Llano	20,592	\$95,680.80	\$23,920.20	\$71,760.60
City of Austin	471,805	\$614,575.75	\$153,643.94	\$460,931.81
Williamson	302,324	\$419,672.60	\$104,918.15	\$314,754.45
Total	1,074,981	\$1,893,066.15	\$473,266.55	\$1,419,799.60

¹ *\$4.75 per record for 1st 20,000 records, \$1.15 per record beyond that. Includes address points, road centerlines, city limits, emergency service zones (ESZs), fire emergency service boundaries (ESB), law enforcement ESB, and emergency medical service ESB

Staff have made the following changes to the Scope of Work (Attachment A) and Data Requirements (Attachment B) relative to the current versions of these documents to reflect new requirements related to work in a NG9-1-1 environment and codifying the performance standards recommended by the GIS Planning Council (GISPC):

1. **Task Added to Scope of Work for Data Submissions Used for Call Routing:** Once in a NG9-1-1 environment, 9-1-1 GIS data can and will be used to determine call-routing for both cell phones and landlines, in addition to its existing use for PSAP mapping applications. Local governments will be expected to submit updates for addresses and roads at least once a month.
2. **Updated Description of Quality Control of Emergency Service Zone (ESZ) and Emergency Service Boundary (ESB) files.** Added clarifying language regarding how changes to ESZ and ESB files will be handled between local governments and CAPCOG staff, allowing for submission of these files at any time throughout the month, and specifying that the performance standard for these files is 100% accuracy. Language in Attachment B: Data Requirements was also updated based on input from the GISPC to better define circumstances in which a “gap” or “overlap” error would occur based on input from the GISPC.
3. **Explicit 98% Accuracy Standard for Addresses and Roads.** As recommended by the GISPC, CAPCOG is using a 98% accuracy performance standard for address and road records. While 100% accuracy is ideal, this 98% target corresponds to NENA recommendations.
4. **Added Automatic Location Information (ALI) information to Data Requirements:** Local governments were already required to maintain the ALI database under the Scope of Work, but Attachment B: Data Requirements did not directly include information specifically about this database or expectations. This section includes performance standards of 98% match between ALI and road records and between ALI and address records that match NENA’s recommendations.
5. **Added Detailed Timeline to Improve Clarity in Submission Windows and Monthly Cycle:** The scope of work now includes a detailed timeline that directly lays out the specific submission window, error correction window, and PSAP map update target date for each month of the performance period. This should help both CAPCOG staff and local governments better plan for these milestones.

It is also important to note that at this time, we are unsure what the exact date will be when the transitions to NG9-1-1 will occur for each local government, and there will still need to be testing that occurs prior to that which may necessitate some additional direction from CAPCOG to local governments. The existing “CAPCOG Guidance and Direction” is intended to provide staff with the flexibility to issue such direction and guidance in response to program needs as we move forward with this process.

Capital Area Council of Governments Interlocal Agreement for 9-1-1 Geographic Information System Database Management

1. Parties and Purpose

- 1.1. The Capital Area Council of Governments ("CAPCOG") is a regional planning commission and political subdivision of the State of Texas organized and operating under the Texas Regional Planning Act of 1965, as amended, chapter 391 of the Local Government Code. One of CAPCOG's functions includes the operation of the Capital Area Emergency Communications District ("CAECD" or "the District") a regional emergency communications district of the State of Texas organized and operating under Chapter 772, Subchapter G of the Health and Safety Code, as amended. On behalf of the District, CAPCOG desires to ensure the highest quality in its 9-1-1 Geographic Information System (GIS) data in order to ensure the success of the region's transition to Next Generation 9-1-1 emergency communications service within the District.
- 1.2. «Local_Government_Name» ("PUBLIC AGENCY") is a Texas County that has agreed to participate in maintaining and updating the district's 9-1-1 GIS database and exercises its authority under Section 251.013 of the Texas Transportation Code to name public roads and assigning address numbers to property located in unincorporated areas of the county.^[HA1]
- 1.3. This Interlocal Agreement (ILA) is entered into between CAPCOG and PUBLIC AGENCY under Chapter 791 of the Texas Government Code in order to compensate the PUBLIC AGENCY for the work required to maintain and update the district's 9-1-1 GIS database.
- 1.4. For the purpose of carrying out CAPCOG's duties and obligations under this agreement, the parties understand and agree that references to CAPCOG includes its employees, officers, directors, volunteers, agents (including the Capital Area Council of Governments – CAPCOG), and their representatives, individually, officially, and collectively.

2. Goods and Services

- 2.1. PUBLIC AGENCY agrees to carry out the scope of work in Attachment A in accordance with the data requirements in Attachment B.

3. Cooperative Purchasing

- 3.1. CAPCOG may periodically identify opportunities to cooperatively purchase goods or services for the 9-1-1 GIS data for participating organizations.
- 3.2. If PUBLIC AGENCY chooses to participate in a cooperative purchase of 9-1-1 GIS goods or services organized by CAPCOG, PUBLIC AGENCY agrees that CAPCOG may deduct the cost of PUBLIC AGENCY's share of those goods or services from the contract price otherwise payable to the PUBLIC AGENCY.

4. Effective Date and Term of Contract

- 4.1. This contract takes effect ~~October 1, 2020~~January 1, 2022, and terminates on September 30, ~~2021~~2022, unless terminated earlier under Section 10.

5. Contract Price and Payment Terms

- 5.1. For work performed under this agreement, CAPCOG agrees to compensate PUBLIC AGENCY an amount not to exceed ~~«FY 2021 Contract Amount»~~«FY 2022 Contract Amount».
- 5.2. PUBLIC AGENCY agrees to invoice CAPCOG as follows for work performed during these quarters:

~~October 1 – December 31, 2020: «Q1_Amount», invoice due by close of business, Friday, January 8, 2021;~~

January 1, 2022 – March 31, ~~2021~~2022: «Q2_Amount», invoice due by close of business, Wednesday, April 7, ~~2021~~2022;

April 1, 2022 – June 30, ~~2021~~2022: «Q3_Amount», invoice due by close of business, Thursday, July 8, 2021; and

July 1, 2022 – September 30, ~~2021~~2022: «Q4_Amount», invoice due by close of business, Thursday, October 7, 2021.

Timely submission of invoices will be considered in CAPCOG's evaluation of PUBLIC AGENCY's performance of this ILA, and CAPCOG reserves the right to reject any invoice submitted more than 90 days after the end of each quarter.

- 5.3. PUBLIC AGENCY agrees to submit a performance report along with each invoice in accordance with the scope of work in Attachment A. If CAPCOG determines that PUBLIC AGENCY has not meet performance expectations described in Attachment A, CAPCOG will provide a written explanation to PUBLIC AGENCY, and PUBLIC AGENCY agrees to provide, within five business days, a comprehensive explanation of the performance deficiency and a plan for achieving performance targets during the next quarter.
- 5.4. CAPCOG agrees to pay invoices within 30 days after receiving a correct invoice, after CAPCOG determines that the PUBLIC AGENCY has fulfilled its obligations for the quarter.
- 5.5. CAPCOG reserves the right to reject in whole or part a quarterly invoice in part or in whole if PUBLIC AGENCY has not adequately fulfilled its obligations under this ILA.

6. Compliance with Applicable Law and Policy

- 6.1. PUBLIC AGENCY agrees to comply with all applicable law and policy in carrying out this ILA.

7. Independent Contractor, Assignment, and Subcontracting

- 7.1. PUBLIC AGENCY is not an employee or agent of CAPCOG, but furnishes goods and services under this ILA solely as an independent contractor.

- 7.2. PUBLIC AGENCY may not assign its rights or subcontract its duties without the written consent of CAPCOG. An attempted assignment or subcontract in violation of this section is void.
- 7.3. If CAPCOG consents to PUBLIC AGENCY's subcontracting of duties, each subcontract is subject to all of the terms and conditions of this ILA, and PUBLIC AGENCY agrees to furnish a copy of this ILA to each subcontractor and furnish, upon request, a copy of PUBLIC AGENCY's contract with any subcontractor to CAPCOG.
- 7.4. If PUBLIC AGENCY wishes to assign the role of project representative to anyone other than a PUBLIC AGENCY employee to serve as its project representative for this ILA, it shall provide documentation to CAPCOG that the subcontractor consents to serve in this capacity.

8. Records and Monitoring

- 8.1. PUBLIC AGENCY agrees to maintain records adequate to document its performance and costs of carrying out this ILA at PUBLIC AGENCY's offices.
- 8.2. Subject to additional requirements of section 8.3, PUBLIC AGENCY agrees to preserve the records for three fiscal years after receiving final payment under this ILA.
- 8.3. If an audit or information in the records is disputed or the subject of litigation, PUBLIC AGENCY agrees to preserve the records until the dispute or litigation is finally concluded, regardless of the ending or early termination of this contract.
- 8.4. Upon advance and reasonable notice to the PUBLIC AGENCY, CAPCOG is entitled to inspect and copy, during normal business hours at PUBLIC AGENCY's offices where they are maintained, the records maintained under this contract for as long as they are preserved. CAPCOG is also entitled to visit PUBLIC AGENCY's offices, talk to its personnel, and audit its records, all during normal business hours, to assist in monitoring its performance under this contract.
- 8.5. CAPCOG reserves the right to visit PUBLIC AGENCY's offices to monitor performance of this contract at least during the performance period to ensure compliance with applicable law and policy. If CAPCOG exercises this option, it will provide PUBLIC AGENCY with a written monitoring report within 30 calendar days of the visit. The report will describe any compliance issues and schedule a follow-up visit if necessary.
- 8.6. CAPCOG agrees to notify PUBLIC AGENCY at least 24 hours in advance of any intended visit under this Section other than as described in Section 8.5. Upon receipt of CAPCOG's notice, PUBLIC AGENCY agrees to notify the appropriate department(s) specified in the notice of CAPCOG's intended visit.

9. Nondiscrimination and Equal Opportunity

- 9.1. PUBLIC AGENCY shall not exclude anyone or entity from participating in PUBLIC AGENCY's duties under this ILA, deny benefits under this ILA, or otherwise discriminate against anyone in carrying out this contract because of any protected category under CAPCOG's personnel policies, which include race, color, religion, sex, age, disability, handicap, veteran status, national origin, sexual orientation, or gender identity.

- 9.2. If PUBLIC AGENCY procures goods or services with funds made available under this ILA, PUBLIC AGENCY agrees to comply with CAPCOG's affirmative action procurement policy, which is set out in CAECD's 9-1-1 Policies and Procedures Manual.

10. Early Termination of Contract

- 10.1. If CAPCOG or PUBLIC AGENCY breaches a material provision of this ILA, the other may notify the breaching party describing the breach and demanding corrective action. The breaching party has five business days from its receipt of notice to correct the breach, or to begin and continue with reasonable diligence and in good faith to correct the breach. If the breach cannot be corrected within a reasonable time as agreed by the parties, despite the breaching party's reasonable diligence and good faith effort to do so, the non-breaching party may terminate the contract or may invoke the dispute resolution process of section 11.
- 10.2. If this ILA is terminated under this section, CAPCOG and PUBLIC AGENCY are entitled to compensation for goods and services provided the other before receiving notice of the suspension or termination. However, neither CAPCOG nor PUBLIC AGENCY is liable to the other for costs it paid or incurred under this contract made after or in anticipate of its receipt of notice of suspension or termination. The fraction of the maximum amount owed for each period described in sections 5.1 and 5.2 will be calculated based on the quarterly amount and fraction of CAPCOG business days during that quarter when the PUBLIC AGENCY carried out work pursuant to this ILA.
- 10.3. Termination for breach under Section 10.1 does not waive either party's claim for direct damages resulting from the breach, and both CAPCOG and PUBLIC AGENCY among other remedies may withhold from compensation owed the other an amount necessary to satisfy its claim against the other.
- 10.4. The termination of this contract does not affect PUBLIC AGENCY's duty to preserve its records and permit inspection, copying, and auditing of its records and visitation of its premises and personnel under section 8.

11. Dispute Resolution

- 11.1. The parties desire to resolve disputes arising under this ILA without litigation. Accordingly, if a dispute arises, the parties agree to attempt in good faith to resolve the dispute between themselves. To this end, the parties agree not to sue one another, except to enforce compliance with this section 11, toll the statute of limitations, or seek an injunction until they have exhausted the procedures set out in this Section 11.
- 11.2. At the written request of either party, each party shall promptly appoint one non-lawyer representative to negotiate informally and in good faith to resolve any dispute arising under this ILA. The representatives appointed shall promptly determine the location, format, frequency, and duration of the negotiations.
- 11.3. If the representatives cannot resolve the dispute within 30 calendar days after the first negotiation meeting, the parties agree to refer the dispute to the Dispute Resolution Center of Austin for mediation in accordance with the Center's mediation procedures by a single

mediator assigned by the Center. Each party agrees to pay half the cost of the Center's mediation services.

- 11.4. The parties agree to continue performing their duties under this contract, which are unaffected by the dispute, during the negotiation and mediation process.
- 11.5. If mediation does not resolve the parties' dispute, the parties may pursue their legal and equitable remedies.
- 11.6. A party's participation in or the results of any mediation or other non-binding dispute resolution process under this section or the provisions of this section shall not be construed as a waiver by party of: (1) any rights, privileges, defenses, remedies, or immunities available to a party; (2) a party's termination rights; or (3) other termination provisions or expiration dates of this ILA.
- 11.7. Nothing shall prevent either party from resorting to judicial proceedings if (a) good faith efforts to resolve a dispute under these procedures have been unsuccessful, or (b) interim resort to a court is necessary to prevent serious and irreparable injury to a party or to others.

12. Notice to Parties and Project Representatives

- 12.1. Notice to be effective under this ILA must be in writing and received by the party against whom it is to operate. Notice is received by a party: A) when it is delivered to the party personally; B) on the date shown on the return receipt if mailed or registered or certified mail, return receipt requested, to the party's address specified in 12.2 or 12.3 and signed for on behalf of the party; or C) three business days after its deposit in the United States mail, with first-class postage affixed, addressed to the party's address specified in Section 12.2 or 12.3.
- 12.2. CAPCOG's address is 6800 Burleson Road, Building 310, Suite 165, Austin, TX 78744, Attn: Executive Director
- 12.3. PUBLIC AGENCY's address is: «Representative_Address».
- 12.4. A party may change its address by providing notice of the change in accordance with Section 12.1
- 12.5. Susan Cooper, CAPCOG GIS Program Manager, is CAPCOG's Project Representative, who is authorized to give and receive communications and directions on behalf of CAPCOG. All communications including all payment requests must be addressed to the CAPCOG's Project Representative or his designee. CAPCOG's Project Representative may indicate a designee through an e-mail to PUBLIC AGENCY's project representative. CAPCOG's Project Representative's phone number is (512) 916-6034, and her e-mail is scooper@capcog.org.
- 12.6. «Project_Representative» is PUBLIC AGENCY's Project Representative, who is authorized to give and receive communications and directions on behalf of PUBLIC AGENCY. All communications including all payment requests must be addressed to the PUBLIC AGENCY's Project Representative or «HisHer» designee. The PUBLIC AGENCY's Project Representative may indicate a designee through an e-mail to CAPCOG's project representative. PUBLIC

AGENCY's Project Representative's phone number is «Representative_Phone_Number», and «HisHer» e-mail is «Project_Representative_email».

13. Miscellaneous

- 13.1. Each individual signing this contract on behalf of a party warrants that he or she is legally authorized to do so and that the party is legally authorized to perform the obligations undertaken. The undersigned warrants that he or she: A) has actual authority to execute this contract on behalf of the governing body identified in this agreement; and verifies the governing body, by either minute order, resolution, or ordinance approved this agreement as required by Texas Government Code Section 791, as amended
- 13.2. This ILA shall be construed and interpreted in accordance with the laws of the State of Texas. Venue for all disputes hereafter shall be solely in Travis County.
- 13.3. This ILA states the entire agreement of the parties, and may be amended only by a written amendment executed by both parties, except that any alterations, additions, or deletions to the terms of this ILA which are required by changes in Federal or State law or regulation are automatically incorporated into this contract without written amendment hereto and shall become effective on the date designated by such law or regulation.
- 13.4. The following Attachments are part of this ILA: A) Scope of Work; and B) Technical Data Requirements.^[A2]
- 13.5. This contract is executed in duplicate originals.

«Local_Government_Name»

CAPITAL AREA COUNCIL OF GOVERNMENTS

By: _____

By: _____

Name: _____

Betty Voights

Title _____

Executive Director

Date: _____

Date: _____

Date of County Governing Body Approval:

Attachment A: Scope of Work

Overview

The goal of this scope of work is to facilitate the exchange of geospatial information between PUBLIC AGENCY and CAPCOG ~~and the PUBLIC AGENCY~~ to help ensure that efficient and accurate response to emergency calls and text messages in all areas of the Capital Area Emergency Communications District (CAECD). In order to accomplish this:

1. Calls and texts must be routed to the correct public safety answering point (PSAP);
2. The correct emergency service provider must be dispatched to the appropriate location; and
3. The emergency responders must be able to know the most efficient route to reach that location.

Definitions

Core 9-1-1 GIS data terminology:

1. **9-1-1 GIS Database:** The geospatial database maintained and updated by the PUBLIC AGENCY that includes, at a minimum, all address points (SSAPs), road centerlines (RCLs), PSAP boundaries, Emergency Service Boundaries (ESBs), Emergency Service Zone (ESZ) boundaries, and city limit (municipal) boundaries for the PUBLIC AGENCY's provisioning boundary
2. **Data Layer:** Also known as a Feature Class, is a group of geographic features that reside in a table of information with corresponding locations on the earth (map) represented as either points, lines, or polygons.
3. **Address Points (SSAPs):** A data layer of points identifying sites or structures associated with a street address, or the location of access to a site or structure, but may also represent landmarks.
4. **Road (Street) Centerlines (RCLs):** A data layer of lines estimating the centerline of a roadway that contains information such as road name, road classification, and address range
5. **City Limit (Municipal) Boundary:** A polygon data layer representing the geographic extent of a city's administrative boundary, not including any extra-territorial jurisdiction. Updates to City Limit boundaries are used to update PSAP, ESB, and ESZ boundaries.
6. **Automatic Location Information (ALI) Database:** A tabular database of landline telephone numbers with associated location information used to route 9-1-1 calls to a PSAP.
7. **Legacy Master Street Address Guide (MSAG) Database:** A tabular database of street names and house number ranges within their associated communities defining ESZs and their associated Emergency Service Numbers (ESNs) to enable proper routing of 9-1-1 calls.

Specialized NG9-1-1 GIS terminology:

1. **Provisioning Boundary:** The authoritative polygon data layer that defines the PUBLIC AGENCY's geographic area of 9-1-1 GIS responsibility. This should be the entire extent of the PUBLIC AGENCY's administrative boundary, plus any other adjacent areas or minus areas within its administrative boundaries as agreed to between the PUBLIC AGENCY and another city or county. Provisioning boundaries may only be modified with express written concurrence between the PUBLIC AGENCY, adjacent PUBLIC AGENCIES, and CAPCOG.

The provisioning boundary should include the area that the PUBLIC AGENCY assigns address points and road names under its own authority, plus any other areas that the PUBLIC AGENCY does not have such authority, but with which it has entered into an exclusive agreement to obtain this information for the 9-1-1 GIS database. Situations that may warrant a change to a provisioning boundary include (but are not limited to): municipal annexations, disannexations, consolidation of two or more municipalities, formation of new municipalities, changes in PSAP service areas, and changes in emergency responder service areas.

2. **PSAP boundary:** The authoritative polygon data layer representing the geographic area within a provisioning boundary served by a single 9-1-1 call center (a PSAP), to which all emergency requests are initially routed.
3. **Emergency Service Boundary (ESB):** A polygon data layer that represents the geographic area of responsibility for emergency response providers within the geographic extent of the provisioning boundary. Each 9-1-1 GIS database includes, at a minimum, a law ESB layer, a fire ESB layer, and an Emergency Medical Services (EMS) ESB layer.
4. **Emergency Service Zone (ESZ):** A polygon data layer representing the area within a provisioning boundary served by a unique combination of law, fire, and EMS responders. ESZs are optional for inclusion in the NG9-1-1 GIS database.
5. **Database Schema:** Also known as Data Model, is the database structure with regard to field properties, including data type, field value constraints, etc. Converting one database schema to another involves field-matching (field-mapping) and other compatibility considerations.
6. **Geo-MSAG:** A geospatially-based database that replaces the MSAG and is created and managed using a road centerline GIS dataset. A city or county must first transition from a traditional tabular MSAG to a Geo-MSAG before it can transition to NG9-1-1. In order to qualify to initiate the transition to a Geo-MSAG, a county must achieve at least 98% match between ALL to RCL records as described later in this document.
7. **Globally Unique IDs (GUIDs):** A unique identifier that is assigned to each record (feature) in an PUBLIC AGENCY's 9-1-1 GIS database; a GUID uniquely identifies a feature both within the PUBLIC AGENCY's 9-1-1 GIS database provisioning boundary and across all 9-1-1 GIS databases.

Quality Control terminology:

1. **Enterprise Geospatial Data Management System (EGDMS):** A cloud-based quality control platform provided by AT&T/Intrado used for identifying critical errors that affect call and dispatch routing that will ~~ultimately~~ be used by the PUBLIC AGENCY to provision (determines acceptable) data to CAPCOG's NG9-1-1 system ~~for call routing in the near future~~. EGDMS ~~cannot~~ ~~does not~~ assess "significant" errors that affect dispatch.
2. **Data-Hub:** a cloud-based quality control platform provided by GeoComm that, in addition to being able to identify critical errors, can also identify "significant" and "other" errors in a PUBLIC AGENCY's 9-1-1 GIS database. DataHub is the system that will provide data to a call taker's map display in the near future.
3. **New Error:** Any error present in the PUBLIC AGENCY's 9-1-1 GIS database update for the first time.
4. **Legacy Error:** Any error in the PUBLIC AGENCY's 9-1-1 GIS database update that was also present in a preceding update.

5. **Accuracy Rate:** The percentage of features that have been assessed by EGDMS, DataHub, or both, as being free of errors or matching a related database.
6. **Error Rate:** The percentage of features that have been assessed as having a critical error, significant error, or as not matching a related database.
7. **Critical Error:** Any error in the PUBLIC AGENCY's 9-1-1 GIS database assessed by EGDMS or DataHub that cause, or have a potential of causing, a critical fault in the routing of a 9-1-1 emergency service request call or text to the correct PSAP; the EGDMS system prevents data with critical errors from being uploaded to the NG9-1-1 system. Examples include (but are not limited to) gaps and overlaps between several of the data layers described above.
8. **Significant Error:** Any error in the PUBLIC AGENCY's 9-1-1 GIS database update found by GeoComm's Data Hub quality control software that cause, or have a potential of causing, a critical fault in Computer-Aided Dispatch (CAD) mapping platforms or other related systems.
9. **Other Error:** Any error in the PUBLIC AGENCY's 9-1-1 GIS database identified by GeoComm's Data Hub quality control software other than a "critical" or "significant" error.

Task 1: Basic Work

Task 1 involves information gathering and data preparation needed for the 9-1-1 GIS database but does NOT involve updating the 9-1-1 GIS database directly.

Task 1.A: PUBLIC AGENCY shall submit to CAPCOG, at least once a month, a comprehensive record of 9-1-1 related information needed for complete and updated 9-1-1 GIS database records for all areas within the PUBLIC AGENCY's Provisioning Boundary consisting of:

1. Street Addresses
2. Roads
3. City limit boundaries
4. ~~PSAP boundaries~~
5. ~~4.~~ Law ESB*
6. ~~5.~~ Fire ESB*
7. ~~6.~~ Emergency Medical Service ESB*
8. ~~7.~~ ESZs*
9. ~~8.~~ Other pertinent information

[*Shall be submitted if changes are requested for CAPCOG approval, otherwise these data are not required to be submitted as part of monthly dataset \(see Task 1D\).](#)

Data submitted by PUBLIC AGENCY must adhere to requirements laid out in Attachment B.

Task 1B: PUBLIC AGENCY shall enter into and maintain agreements with all other local governments with the authority to assign address points, assign road names and address ranges, alter municipal boundaries, or change the geographic coverage of emergency service providers in order to ensure that these entities provide such data to PUBLIC AGENCY in a timely manner. When such changes occur, PUBLIC AGENCY shall provide CAPCOG with adequate advance notice of any substantive changes that could or should affect PSAP boundaries, ESB boundaries, provisioning boundaries, or any sub-contracting in order for an orderly transition as a result of any pending new agreement, amendment, or agreement termination.

Task 1C: PUBLIC AGENCY shall be responsible for conveying any relevant information ~~deriving~~ from CAPCOG regarding 9-1-1 GIS database integrity to other local governments and governmental entities partially or wholly within its provisioning boundary.

Task 1D: PUBLIC AGENCY shall provide to CAPCOG information from any County Commissioners' Court meetings or City Council meetings that would affect PUBLIC AGENCY's performance of this contract, including (but not limited to) changes to PSAPs, ESBs/ESZs, annexation, or subcontracting. PUBLIC AGENCY's Project Representative is expected to keep track of County Commissioners Court and City Council meeting agendas to determine if an item may affect the performance of this contract, and notify CAPCOG's project representative of any such issues as soon as possible, but no later than 2 days prior to the Commissioners Court or City Council meeting. Such information includes, but is not limited to, annexation notices, disannexation notices, and interlocal agreements related to emergency services and coverage areas. To the extent possible, CAPCOG will use the ESB and ESZ data submitted by the PUBLIC AGENCY in the 9-1-1 system. However, CAPCOG reserves the right to make adjustments to these data and/or reinstate prior versions if the data submitted by PUBLIC AGENCY are found to have errors.

Regardless of any such changes made by local governments within their provisioning boundary, those changes will not be made in the 9-1-1 system until this information is provided to CAPCOG, CAPCOG accepts the information, and makes the corresponding changes in the 9-1-1 system. -CAPCOG shall make PUBLIC AGENCY aware of any required changes to these boundaries within three business days of being provided with the polygon data. -Note that changes to these data may be sent to CAPCOG at any point during the month. PUBLIC AGENCY is responsible for downloading and using the latest authoritative version of the ESZ/ESB files used in the 9-1-1 system from CAPCOG at the beginning of each month to avoid repetition of errors if they have occurred.

Task 1.E: PUBLIC AGENCY shall send at least one representative to each scheduled ~~quarterly~~ 9-1-1 GIS User Group meetings (GMUG) and at least one training workshop hosted by CAPCOG during the performance period of this agreement.

Task 2: GIS Work for PSAP Map Updates

Task 2 involves GIS work needed for directly maintaining and updating the 9-1-1 GIS database for use in monthly updates to PSAP mapping applications. This is work that CAPCOG would need to perform if the PUBLIC AGENCY did not do so. CAPCOG's expectation is that this work would be performed by a person, either on staff or subcontracted by the PUBLIC AGENCY, with responsibilities, knowledge, skills, education, and experience comparable to the state's "Geographic Information Specialist II" job description.¹ . PUBLIC AGENCY must maintain at least one ESRI ArcGIS software license as specified in Attachment B in order to carry out this work. Task 2 includes the following sub-tasks:

Task 2.A: PUBLIC AGENCY shall submit all information required under Task 1.A that corresponds to GIS data layers in the 9-1-1 GIS database at least once a month. This will be provided in ESRI File geodatabase format (.gdb) pursuant to Attachment B and any other CAPCOG guidance at least once a month to CAPCOG on the 1st business day of each month or up to five business days prior to the 1st business day of the month, or more frequently as specified by CAPCOG once PUBLIC AGENCY has completed the transition to NG9-1-1. PUBLIC AGENCY shall first submit road centerline, street address point, city limit boundary data and their respective ALI extract for that month to ~~EGDMS and~~ Data-Hub

¹ Available online at: <http://www.hr.sao.texas.gov/CompensationSystem/JobDescriptions/>

in order to identify and address any mismatches between the ALI database and PUBLIC AGENCY's RCL and address point data, "critical" errors, and "significant" errors. ~~These~~ This quality control systems require the 9-1-1 GIS database to match the standardized database schema (data model) for these systems through field-matching (field-mapping) procedures and other standards. ~~Based on the recommendations of CAPCOG's GIS Planning Committee, CAPCOG staff will develop performance standards for target error rates, and will communicate these performance standards to PUBLIC AGENCY at a later date through guidance.~~

Task 2.B: PUBLIC AGENCY shall address any errors identified by ~~EGDMS and~~ Data-Hub validation checks (reports) or CAPCOG Quality Control reports from those systems as soon as possible, but no later than the following conventional monthly submission to CAPCOG. This includes coordination with adjacent PUBLIC AGENCIES and CAPCOG where necessary.

Task 2.C: PUBLIC AGENCY shall address any other discrepancies identified by authorized stakeholders including, but not limited to, PSAP 9-1-1 call-takers.

Task 2.D: At least once a month, PUBLIC AGENCY shall back up the 9-1-1 GIS database and store it in a secure place. PUBLIC AGENCY shall include a record of the dates the database was backed up in the activity reports that are required to be submitted with quarterly invoices.

Task 2.E: In addition, PUBLIC AGENCY shall maintain the ALI ~~and MSAG~~ databases within the PUBLIC AGENCY's provisioning boundary. This includes, but is not limited to, correcting telephone number database errors, maintenance and quality-control of an accurate 9-1-1 call location map, ~~and providing MSAG updates and corrections to the database vendor. If PUBLIC AGENCY has met the required 98% match between ALI to RCLs determined by Intrado and transitioned to a GeoMSAG, MSAG database updates and management will be made through uploads of the RCL GIS feature class to EGDMS, which should occur whenever roads are created, deleted, or updated.~~

Task 3: Updates for Call-Routing

In a NG9-1-1 environment, the GIS database is used not only for PSAP mapping applications, but also to route both cell and landline phone calls to the proper PSAP. Whereas for the monthly PSAP map update, CAPCOG aggregates data submitted from PUBLIC AGENCY with all of the other local governments under contract with CAPCOG and the pushes these data out to the PSAPs, for call routing updates, PUBLIC AGENCY will submit data directly to EGDMS.

Task 3.A: PUBLIC AGENCY shall submit the most recent 9-1-1 road centerline and street address GIS data and ALI extracts from Task 2 to EGDMS at least once a month on the first business day of the month or up to five business days prior to that date. While PUBLIC AGENCY may submit updates to EGDMS more frequently than once a month, it will be expected to make at least one submission within this window each month and CAPCOG will only be assessing performance based on PUBLIC AGENCY's submission during this window. RCL updates submitted by PUBLIC AGENCY to EGDMS will automatically update PUBLIC AGENCY's GeoMSAG.

Task 3.B: To the extent EGDMS identifies any critical errors in the 9-1-1 databases submitted by PUBLIC AGENCY, PUBLIC AGENCY must work on correcting any such errors prior to the next monthly submission. Failure to make progress in correcting critical errors identified in the prior month's submission will be

noted in CAPCOG's comprehensive performance reports and should be noted and explained in quarterly reports submitted by PUBLIC AGENCY when submitting an invoice to CAPCOG.

Content of Quarterly Reports

Along with each quarterly invoice, PUBLIC AGENCY will submit an activity report that contains all of the following information related to activities that occurred in the quarter:

- For each applicable governmental entity with administrative boundaries within PUBLIC AGENCY's provisioning boundary, PUBLIC AGENCY shall provide a summary of actions taken each month relevant to the 9-1-1 GIS database-, including any new records added since the last update and errors corrected.
- The date and time of the PUBLIC AGENCY's last backup of its 9-1-1 GIS database each month of the quarter.
- Dates and basic summaries (such as total number of features) of data submissions to CAPCOG.
- A summary of any work that involved resolution of boundary issues with other entities, correction of errors and resolution of any other issues related to this contract
- An explanation for any performance issues during the quarter and corrective action that will be taken to address and prevent such issues in the future, including:
 - Late or incomplete data submissions;
 - Failure to meet performance expectations for ALI to RCL match accuracy rates, critical error accuracy rates, or significant error rates; and
 - Any other issue identified by CAPCOG in a performance report.

CAPCOG will provide PUBLIC AGENCY the template to use for activity reports.

Timeline

The following timeline should be used by PUBLIC AGENCY in planning its submission of data to DataHub and CAPCOG for PSAP map updates (Task 2) and to EGDMS for and call-routing updates (Task 3):

- January 2022:
 - Submission window: December 22, 2021 – January 3, 2022
 - Error correction window for PSAP map updates: January 4, 2022 – January 7, 2022
 - CAPCOG pushes out PSAP map update: January 11, 2022
- February 2022:
 - Submission window: January 25, 2022 – February 1, 2022
 - Error correction window for PSAP map updates: February 2, 2022 – February 7, 2022
 - CAPCOG pushes out PSAP map update: February 9, 2022
- March 2022:
 - Submission window: February 22, 2022 – March 1, 2022
 - Error correction window for PSAP map updates: March 2, 2022 – March 7, 2022

- CAPCOG pushes out PSAP map update: March 9, 2022
- April 2022:
 - Submission window: March 25, 2022 – April 1, 2022
 - Error correction window for PSAP map updates: April 2, 2022 – April 7, 2022
 - CAPCOG pushes out PSAP map update: April 11, 2022
- May 2022:
 - Submission window: April 25, 2022 – May 2, 2022
 - Error correction window for PSAP map updates: May 3, 2022 – May 6, 2022
 - CAPCOG pushes out PSAP map update: May 10, 2022
- June 2022:
 - Submission window: May 24, 2022 – June 1, 2022
 - Error correction window for PSAP map updates: June 2, 2022 – June 7, 2022
 - CAPCOG pushes out PSAP map update: June 9, 2022
- July 2022:
 - Submission window: June 24, 2022 – July 1, 2022
 - Error correction window for PSAP map updates: July 2, 2022 – July 8, 2022
 - CAPCOG pushes out PSAP map update: July 12, 2022
- August 2022:
 - Submission window: July 25, 2022 – August 1, 2022
 - Error correction window for PSAP map updates: August 2, 2022 – August 5, 2022
 - CAPCOG pushes out PSAP map update: August 9, 2022
- September 2022:
 - Submission window: August 25, 2022 – September 1, 2022
 - Error correction window for PSAP map updates: September 2, 2022 – September 8, 2022
 - CAPCOG pushes out PSAP map update: September 12, 2022

CAPCOG Guidance and Direction

In addition to the Performance Reports identified in Task 2.B, CAPCOG may issue technical guidance or direction to PUBLIC AGENCY's Project Representative that provides further clarification, interpretation, and details. Failure to follow any such guidance would constitute a performance deficiency for this agreement.

Prior to transitioning PUBLIC AGENCY to NG9-1-1, CAPCOG will issue an addendum with a modified scope of work that will cover expectations once a transition to NG9-1-1 occurs. CAPCOG also anticipates issuing updated performance goals for critical error accuracy rates, significant error accuracy rates, and frequency of database updates once a local government has transitioned to NG9-1-1 following the 7/23/2021 GISPC meeting.

Attachment B: CAPCOG Next Generation 9-1-1 GIS Data Requirements Version 1 (October 2021)

1 Summary

The following geospatial data and corresponding attribute specifications are required to be regularly maintained by each county for Mapped Automated Location Information (ALI) and use in a Next Generation 9-1-1 system which relies on GIS for call and dispatch routing through the Location Validation Function (LVF) and Emergency Call Routing Function (ECRF).

This document is referenced in the Capital Area Council of Governments Interlocal Agreement for 9-1-1 Geographic Information System Database Management and is commonly called “Attachment B Requirements”.

The GIS Data requirements in this document are a condensed version of, and based upon, data standards created by NENA (National Emergency Number Association) as they are developed and evolve over time. These data model standards should be more thoroughly reviewed in the “NENA Standard for NG9-1-1 GIS Data Model” document. Specifics regarding address point placement methodologies should be reviewed in the “NENA Information Document for Development of Site/Structure Address Point GIS Data for 9-1-1” document. There are other useful resources and training, as well, that CAPCOG has created and can provide.

As per “Task 1.A and Task 2.A” in “Attachment A: Scope of Work”, please provide monthly updates of the 9-1-1 datasets referenced in this document in ESRI file geodatabase format to the GeoComm GIS Data Hub, Intrado EGDMS, and CAPCOG FTP location by close of business the 1st business day of each month. This ensures that data is available for the PSAPs by close of the 7th business day of that month. Submissions may be sent up to five business days before the 1st business day of the next month, but ideally would be sent on the 1st business day as CAPCOG wants to capture as many edits as possible that happen over the course of a given month. Incomplete datasets or other data abnormalities related to requirements may be returned to the county for correction, and must be returned by close of business on the 5th business day, however, this does not guarantee that the submission will be included in the dataset provided to the PSAPs. If there is a situation in which a submission is not possible by the end of the 1st business day of the month, CAPCOG must be made aware and will work with PUBLIC AGENCY to obtain that month’s data.

CAPCOG will update, create, and otherwise manage the PSAP and Provisioning Boundaries for each local jurisdiction and provide these data layers to jurisdiction for Task 2: GIS Work. CAPCOG will also provision these datasets to both quality-control systems for their use in call and dispatch routing as well as map display and reference. As described in “Task 1B, [county-PUBLIC AGENCY](#) shall enter into and maintain agreements with all other local governments with the authority to assign address points, assign road names and address ranges, alter municipal boundaries, or change the geographic coverage of emergency service providers in order to ensure that these entities provide such data to county in a timely manner. When such changes occur, local jurisdiction shall provide CAPCOG with adequate

advance notice of any substantive changes that could or should affect PSAP boundaries, ESB/ESZ boundaries, provisioning boundaries, or any sub-contracting in order for an orderly transition as a result of any pending new agreement, amendment, or agreement termination.

~~Local jurisdictions are~~ PUBLIC AGENCY responsible for the creation and maintenance of the ESZ and ESB data within their provisioning boundary. To the extent possible, CAPCOG will use the ESB and ESZ data submitted by the local jurisdiction in the 9-1-1 system. However, CAPCOG reserves the right to make adjustments to these data and/or reinstate prior versions if the data submitted are found to have errors. ~~The local jurisdiction is responsible for downloading and using the latest authoritative version of the ESZ/ESB files used in the 9-1-1 system from CAPCOG at the beginning of each month to avoid repetition of errors if they have occurred. Note that~~ regardless of any such changes made by local governments within their provisioning boundary, those changes will not be made in the 9-1-1 system until this information is provided to CAPCOG, CAPCOG accepts the information, and makes the corresponding changes in the 9-1-1 system. CAPCOG shall make county PUBLIC AGENCY aware of any required changes to these boundaries within three business days of being provided with the polygon data. Note that changes to these data may be sent to CAPCOG at any point during the month. The local jurisdiction is responsible for downloading and using the latest authoritative version of the ESZ/ESB files used in the 9-1-1 system from CAPCOG at the beginning of each month to avoid repetition of errors if they have occurred.

Regarding database fields and data types, each is very specific and must follow the exact guidelines outlined below. Remember to keep the field names in your database the same as those listed, and in the same order, and that all entries for every field must be in UPPER CASE. The complete attribute definitions shown in the GIS data tables are described and defined in the “Database Format” sections for each dataset. The data fields shown as Mandatory and Conditional must be present in the data. In the tables below, the column M/C/O is to indicate whether the attribute values is Mandatory (M), Conditional (C), or Optional (O).

- **Mandatory (M)** signifies an attribute value must exist
- **Conditional (C)** signifies that if the attribute information exists in the real world, it must be included. If no value exists for the feature, the individual value is left blank without an empty space (if text), or 0 (if numeric)
- **Optional (O)** signifies an attribute value may or may not be included in the data field

In the GIS data tables below, the **TYPE** column indicates the data type used for the data field.

- **TEXT** – string of alphanumeric characters including any combination of alphabetical letters A-Z and numbers 0-9
- **DATE** – Date and time using ISO 8601 compliant formats which are in the format of YYYY-MM-DD HH:MM:SS
- **DOUBLE** – double precision floating point numeric values with decimals
- **LONG** – whole numeric values ranging from -2,147,483,648 to +2,147,483,647 without decimals in the GIS data tables below, the **WIDTH** column indicates the number of allowable characters within each field.

2 Road Centerlines (RCL)

This line data represents road networks in the CAPCOG region. This layer includes the street names and address ranges used to assign an address.

The performance standard for the Road Centerlines feature class is 98% accuracy. This means that 98% of the database records should be free of critical and significant errors.

2.1 Graphic (Spatial) Edits

Each named street needs to be represented in the GIS graphically and include attribution for all database fields listed below. All unnamed streets included in the street centerline layer are required to have the designation “DRVW” entered in the ‘street name (ST_NAME)’ field and have any other relevant attribute information completed, including the ‘CLASS’ field. When a street centerline is created or edited, several sources and methods can be used, including current aerial imagery, georeferenced survey plats, computer-aided design (CAD) files, parcels, mapping-grade GPS units in the field, or other authoritative sources or methods. The positional accuracy of addressed structures should be within +/- 5 feet of the center of the roadbed (the part on which vehicles travel) noting that when roadways are divided (i.e by a median) the roadbeds on each side should have a centerline drawn. In all cases each new street centerline will need to be split, or checked for gaps, at each jurisdiction and ESN line/boundary intersection. Street segment direction must be correct as well. These items and other geometric relationships are referred to as “topology”, and especially important for NG9-1-1 purposes.

2.2 Database Format

The following table details the data format requirements for the RCL database.

Table 2-12-1. RCL Database Format

FIELD NAME	M/C/O	TYPE	WIDTH	DESCRIPTION/ VALID ENTRIES
SOURCE	M	TEXT	75	Agency that last updated the record, i.e. FAYETTE, TRAVIS
PROVIDER	M	TEXT	75	The name of the regional 911 authority <i>CAPCOG will populate</i>
LAST_MOD	M	DATE	26	Date of last update using ISO 8601 format
EFF_DATE	O	DATE	26	Date the new record information goes into effect in ISO 8601 format
SEGMENTID	O	LONG	DEFAULT	Unique segment ID <i>CAPCOG will populate prior to uploading to PSAP. May also serve as a placeholder field to populate SITEUNGID field</i>
RCL_UNIQID	M	TEXT	100	Globally Unique ID for each road segment. Ex. 894RCL@co.blanco.tx.us
COUNTRY	M	TEXT	2	Country name represented by two capital letters
L_STATE	M	TEXT	2	Left state name by two letters defined by USPS publication 28
R_STATE	M	TEXT	2	Right state name by two letters defined by USPS publication 28
L_COUNTY	M	TEXT	40	Fully spelled county name on the left side of the road
R_COUNTY	M	TEXT	40	Fully spelled county name on the right side of the road
L_MUNI	M	TEXT	100	Name of municipality on Left, if none populate with “UNINCORPORATED”

FIELD NAME	M/C/O	TYPE	WIDTH	DESCRIPTION/ VALID ENTRIES
R_MUNI	M	TEXT	100	Name of municipality on Right, if none populate with "UNINCORPORATED"
L_MUNI_DIV	C	TEXT	100	Name of municipality division on Left, i.e. "WARD 5 FRIENDSHIP DISTRICT"
R_MUNI_DIV	C	TEXT	100	Name of municipality division on Right i.e. "WARD 5 FRIENDSHIP DISTRICT"
L_NBRHOOD	O	TEXT	100	Name of neighborhood or subdivision on Left
R_NBRHOOD	O	TEXT	100	Name of neighborhood or subdivision on Right
L_RNG_PRE	C	TEXT	15	Part of an address preceding the numeric address on Left
R_RNG_PRE	C	TEXT	15	Part of an address preceding the numeric address on Right
LF_ADDR	M	LONG	DEFAULT	Left address number at the FROM node
LT_ADDR	M	LONG	DEFAULT	Left address number at the TO node
RF_ADDR	M	LONG	DEFAULT	Right address number at the FROM node
RT_ADDR	M	LONG	DEFAULT	Right address number at the TO node
L_PARITY	M	TEXT	1	E, O, B, Z for Even, Odd, Both, or Zero (if the range is 0 to 0)
R_PARITY	M	TEXT	1	E, O, B, Z for Even, Odd, Both, or Zero (if the range is 0 to 0)
L_POST_COM	C	TEXT	40	City name for the ZIP of an address, as given in the USPS on Left
R_POST_COM	C	TEXT	40	City name for the ZIP of an address, as given in the USPS on Right
L_ZIP	C	TEXT	5	5-digit numeric postal code area on Left
R_ZIP	C	TEXT	5	5-digit numeric postal code area on Right
L_ESN	M	TEXT	5	5-digit Emergency Service Number as identified by ESN on Left. If the ESN number only has 2-3 digits, it must be preceded by zeros
R_ESN	M	TEXT	5	Emergency Service Number as identified by ESN on Right. Must be preceded by zeros if less than 5 digits, i.e. "00088" for ESN 88
L_MSAG	M	TEXT	30	Valid service community as identified by MSAG on Left
R_MSAG	M	TEXT	30	Valid service community as identified by MSAG on Right
PRE_MOD	O	TEXT	15	Word or phrase separate from type and direction that precedes PRE_DIR i.e. Access, Alternate, Business, Connector, Extension, Scenic, Spur, Ramp Underpass, Overpass
PRE_DIR	C	TEXT	2	Leading directional prefix N, S, E, W, NE, NW, SE, SW
PRE_TYPE	C	TEXT	20	Spelled out word or phrase that precedes and identifies a type of thoroughfare

FIELD NAME	M/C/O	TYPE	WIDTH	DESCRIPTION/ VALID ENTRIES
ST_NAME	M	TEXT	60	Legal street name as assigned by local addressing authority
ST_TYPE	C	TEXT	4	Type of street following the street name, valid entries on USPS Pub 28
POST_DIR	C	TEXT	2	Trailing directional suffix N, S, E, W, NE, NW, SE, SW
POST_MOD	C	TEXT	12	Word or phrase separate from type and direction that follows ST_NAME
FULL_NAME	M	TEXT	125	Full street name, should be a concatenation of 4 fields: PRE_DIR, ST_NAME, ST_TYPE and POST_DIR with no trailing or leading spaces
ST_ALIAS	C	TEXT	125	Entire alias street name assigned to street segment
ONE_WAY	O	TEXT	2	B, FT, TF for Both, FROM node to TO node, TO node to FROM node
SP_LIMIT	O	LONG	DEFAULT	Posted speed limit in MPH
CLASS	M	TEXT	4	Street type designation code (See ROC Road Class Codes below)
RDCLS_TYP	O	TEXT	15	See valid Road Class Types below
NOTES	O	TEXT	75	Additional information

2.3 [ROC Road Class Codes](#) ('Street Type') Designation

The following list of codes are used in the "Class" field in the RCL Database:

- IH – Interstate
- US – US highways SH – State highways
- FM – Farm to Market, Ranch Road, Ranch to Market
- LS – City Street, County Road, Park Road, Recreational, Frontage Road AC – Access Road, Crossover
- PVT- Private Road TR – Toll Road
- RAMP- On-ramp, Off-ramp
- DW – Driveways

2.4 Road Class I Types

The following list of codes are used in the "RDCLS_TYP" field in the RCL Database:

- Primary Secondary
- Local (City, Neighborhood, or Rural Road) Ramp
- Service (usually along a limited access highway) Vehicular Trail (4WD, snowmobiles)
- Walkway (Pedestrian Trail, Boardwalk) Alley
- Private (service vehicles, logging, oil fields, ranches, etc.) Parking Lot
- Trail (Ski, Bike, Walking / Hiking Trail)

3 Site / Structure Address Points (SSAP)

This point data represents addressable sites, structures, or property entrances that exist within the

CAPCOG region.

3.1 Graphic (Spatial) Edits

All addressed site/structures must be represented in the address point layer. When a site/structure point is created or edited, several sources and methods can be used, including aerial imagery, georeferenced survey plats, computer-aided design (CAD) files, parcels, mapping-grade GPS units in the field, or other authoritative sources and methods. When the actual structure location is known, the symbol should represent the general center of the structure. In other cases, please refer to the “NENA Information Document for Development of Site/Structure Address Point GIS Data for 9-1-1” document. In any case, the positional accuracy of structures or designated site locations should be within +/- 25 feet of their true location or intended designation.

The performance standard for the Site Structure Address Point feature class is 98% accuracy. This means that 98% of the database records should be free of critical and significant errors.

3.2 Database Format

The following table details the data format requirements for the SSAP database.

Table 3-13-1. SSAP Database Format

FIELD NAME	M/C/O	TYPE	WIDTH	DESCRIPTION/ VALID ENTRIES
SOURCE	M	TEXT	75	Agency that last updated the record, i.e. HAYS, WILLIAMSON
PROVIDER	M	TEXT	75	The name of the regional 911 authority <i>CAPCOG will populate</i>
LAST_MOD	M	DATE	26	Date of last update using ISO 8601 format
EFF_DATE	O	DATE	26	Date the new record information goes into effect in ISO 8601 format
SITE_ID	O	LONG	DEFAULT	Unique site ID <i>CAPCOG will populate prior to uploading to PSAP. May also serve as a placeholder field to populate SITEUNGID field</i>
SITEUNQID	M	TEXT	100	Globally unique ID for each address site or structure. Ex. 2545AP@co.lee.tx.us
COUNTRY	M	TEXT	2	Country name represented by two capital letters
STATE	M	TEXT	2	State name by two letters defined by USPS publication 28
COUNTY	M	TEXT	40	County name or equivalent fully spelled out
MUNICIPAL	M	TEXT	100	Name of municipality, if none populate with "UNINCORPORATED"
MUNI_DIV	C	TEXT	100	Name of municipality division i.e. "WARD 5 FRIENDSHIP DISTRICT"
NBRHOOD	C	TEXT	100	Name of neighborhood or subdivision where the address is located
ADDNUM_P R E	O	TEXT	15	Part of an address leading the numeric address
ADDR_NUM	M	LONG	DEFAULT	Numeric identifier of a location along a thoroughfare
ADDNUM_SU F	C	TEXT	15	Part of an address following the address number i.e. ½, B
PRE_MOD	O	TEXT	15	Word or phrase separate from type and direction that precedes PRE_DIR i.e. Access, Alternate, Business, Connector, Extension, Scenic, Spur, Ramp Underpass, Overpass
PRE_DIR	C	TEXT	2	Leading directional prefix N, S, E, W, NE, NW, SE, SW
PRE_TYPE	O	TEXT	20	Spelled out word or phrase that precedes and identifies a type of thoroughfare
ST_NAME	M	TEXT	60	Legal street name as assigned by local addressing authority
ST_TYPE	C	TEXT	4	Type of street following the street name, valid entries on USPS Pub 28

FIELD NAME	M/C/O	TYPE	WIDTH	DESCRIPTION/ VALID ENTRIES
POST_DIR	C	TEXT	2	Trailing directional suffix N, S, E, W, NE, NW, SE, SW
POST_MOD	O	TEXT	12	Word or phrase separate from type and direction that follows ST_NAME
FULL_NAME	M	TEXT	125	Full street name, must be identical to the site's related road FULL_NAME
ST_ALIAS	C	TEXT	125	Entire alias street name assigned to related street segment
FULL_ADDR	M	TEXT	170	Full address, should be a concatenation of ADDNUM_PRE + ADDR_NUM + ADDNUM_SUF + FULL_NAME with no extra, leading and trailing spaces
ESN	M	TEXT	5	Emergency Service Number associated with the address and community name Preceded by '0' if digits are less than 5
MSAG_COM	M	TEXT	30	Valid service community associated with the location of the address
POSTAL_COM	M	TEXT	40	City name for the ZIP of an address, as given in the USPS
ZIP	C	TEXT	5	5-digit numeric postal code area
ZIP4	O	TEXT	4	ZIP plus 4 code without the dash
BLDG	O	TEXT	75	One among a group of buildings that have the same address
FLOOR	O	TEXT	75	A floor, story or level within a building
UNIT	O	TEXT	75	A suite or group of rooms within a building that share the same entrance
ROOM	O	TEXT	75	A single room within a building
SEAT	O	TEXT	75	A place where a person sits within a building i.e. cubicle
LANDMARK	O	TEXT	150	The name by which a prominent feature is publicly known or Vanity address
MILEPOST	C	LONG	DEFAULT	A posted numeric measurement from a given beginning point
SITE_TYPE	C	TEXT	50	Type of feature identified by the address i.e. residential, office, store, school
POINT_X	O	DOUBLE	DEFAULT	Longitude of point in decimal degrees using EPSG: 4326
POINT_Y	O	DOUBLE	DEFAULT	Latitude of point in decimal degrees using EPSG: 4326

FIELD NAME	M/C/O	TYPE	WIDTH	DESCRIPTION/ VALID ENTRIES
NOTES	O	TEXT	254	Additional location information, which is not a building, floor, unit, room or seat
ELEVATION	O	DOUBLE	DEFAULT	Height above Mean Sea Level in meters

4 Emergency Service Zones (ESZ)

This polygon data consists of the intersection of law enforcement, fire district, and emergency medical service and telephone exchange boundaries in the CAPCOG region.

The performance standard for the Site Emergency Service Zones feature class is 100% accuracy. This means all database records should be free of critical errors.

4.1 Graphic (Spatial) Edits

These areas need to accurately reflect the boundaries of each geographically unique combination of fire, law and EMS responder zones. This layer is created and maintained by overlaying with some combination of street centerlines, municipal (i.e. city limit) boundaries, parcels boundaries, or other data to determine each jurisdiction's emergency response service areas. As new emergency response services are added to, or change in an area, this boundary file will need to be modified accordingly.

Communications must be regularly preserved with all fire, law, and emergency medical responders to obtain the information required to maintain updated ESZ boundaries. These ESZ boundaries should adhere to the specifications of CAPCOG's QC systems and have no gaps or overlaps within a topology tolerance of +/- 3 feet should be within +/- 3 feet of their true location with no gaps or overlaps.

[HA1] These items Topology and other geometric relationships between feature classes are referred to as "topology", are especially important for NG9-1-1 purposes. In addition, it is very important that all features with identical attribute information are merged into one multipart polygon.

4.2 Database Format

The following table details the data format requirements for the ESZ database.

Table 4-14-1. ESZ Database Format

FIELD NAME	M/C/O	TYPE	WIDTH	DESCRIPTION/ VALID ENTRIES
SOURCE	M	TEXT	75	Agency that last updated the record, i.e. BASTROP, BURNET
PROVIDER	M	TEXT	75	The name of the regional 911 authority <i>CAPCOG will populate</i>
LAST_MOD	M	DATE	26	Date of last update using ISO 8601 format
EFF_DATE	O	DATE	26	Date the new record information goes into effect in ISO 8601 format
ES_UNQID	M	TEXT	100	ID for each emergency service polygon - <i>CAPCOG will populate</i>
LAW	M	TEXT	60	Name of law service provider
FIRE	M	TEXT	60	Name of fire service provider
MEDICAL	M	TEXT	60	Name of medical service provider
COUNTRY	M	TEXT	2	Country name represented by two capital letters

FIELD NAME	M/C/O	TYPE	WIDTH	DESCRIPTION/ VALID ENTRIES
STATE	M	TEXT	2	State name by two letters defined by USPS publication 28
COUNTY	M	TEXT	40	County name fully spelled out
URI	M	TEXT	254	URN/URL for routing. Example: sip:sos@ausxtxem1.travis.tx.us
URN	M	TEXT	50	The URN for the Emergency Service or other Well-Known Service (Example: "urn:service:sos" for a PSAP or "urn:service:sos.ambulance" for an ambulance service)
ESN	M	TEXT	5	ESN of the responding agency preceded by '0' if number of digits < 5
TANDEM	M	TEXT	3	911 Selected Router Code
TANDEM2	C	TEXT	3	911 Selected Router Code
ESSID	M	TEXT	2	Unique tandem routing code <i>CAPCOG will populate</i>
ESNGUID	M	TEXT	8	Concatenation of ESN and ESSID separated by a single forwardslash "/" CAPCOG will concatenate
AVCARDURI	C	TEXT	254	URI for the vCARD of contact information

5 Emergency Service Boundaries (ESB)

This polygon data consists of Emergency Service Boundary layers that define the geographic area for the primary providers of response services in the CAPCOG region.

[The performance standard for the Site Emergency Service Boundaries feature class is 100% accuracy. This means all database records should be free of critical errors.](#)

5.1 Graphic (Spatial) Edits

Each of these layers is used by the ECRF to perform a geographic query to determine which Emergency Service Providers are responsible for providing service to a location in the event a selective transfer is desired, to direct an Emergency Incident Data Document to a secondary PSAP for dispatch, or to display the responsible agencies at the PSAP. In addition, Emergency Service Boundaries are used by PSAPs to identify the appropriate entities/first responders to be dispatched. Each Emergency Service Boundary layer may contain one or more polygon boundaries that define the primary emergency services for that geographic area. As new emergency response services are added to, or change in an area, this boundary file will need to be modified accordingly. **Communications must be regularly preserved with all fire, law, and emergency medical responders to obtain the information required to maintain updated boundaries. These Emergency Service Boundaries should adhere to the specifications of CAPCOG's QC systems and have no gaps or overlaps within a topology tolerance of +/- 3 feet. should be within +/- 3 feet of their true location with no gaps or overlaps and The ESBs can be created by dissolving the Emergency Service Zones polygon data. [HA2] These items and other geometric relationships are referred to as "topology", and especially important for NG9-1-1 purposes. **In addition, it is very important that all features with identical attribute information are merged into one multipart polygon****

There MUST be a separate Emergency Service Boundary layer for each type of service. The set of Emergency Service Boundaries MUST include, at a minimum, the following:

- Law Enforcement;
- Fire; and

- Emergency Medical Services (EMS).

Other Emergency Service Boundaries MAY include, but are not limited to:

- Poison Control;
- Forest Service; and
- Animal Control.

5.2 Database Format

The following table details the data format requirements for the ESB database.

Table 5-15-1. ESB Database Format

FIELD NAME	M/C/O	TYPE	WIDTH	DESCRIPTION/ VALID ENTRIES
DISCRPAGID	M	TEXT	75	Agency that last updated the record, i.e. BASTROP, BURNET
DATEUPDATE	M	DATE	26	Date of last update using ISO 8601 format
EXPIRE	O	TEXT	26	Unique tandem routing code <i>CAPCOG will populate</i>
EFFECTIVE	O	TEXT	26	The date and time when the information in the record is no longer considered valid.
ES_NGUID	M	TEXT	254	Globally unique ID for each emergency service boundary polygon – Ex. 210EMS@blanco.co.tx.us
STATE	M	TEXT	2	State name by two letters defined by USPS publication 28
AGENCYID	M	TEXT	100	A Domain Name System (DNS) domain name which is used to uniquely identify an agency. Ex. austintexas.gov
SERVICEURI	M	TEXT	254	URN/URL for routing. Example: sip:sos@ausxtxm1.travis.tx.us
SERVICEURN	M	TEXT	50	The URN for the Emergency Service or other Well-Known Service*
SERVICENUM	M	TEXT	15	The numbers that would be dialed on a 12-digit keypad to reach the emergency service appropriate for the location. Ex: 911
AVCARDURI	C	TEXT	254	URI for the vCARD of contact information
DISPLAYNAME	M	TEXT	60	Name of the service provider that offers services within the area of an Emergency Service Boundary

6 Municipal Boundary

This polygon data represents municipal boundaries in the CAPCOG region.

6.1—[The performance standard for the Site Emergency Service Boundaries feature class is 100% accuracy. This means all database records should be free of critical errors.](#)

6.26.1 Graphic (Spatial) Edits

When city limits change due to annexations, metes and bounds surveys or other related information

must be acquired to update the city limit boundaries. Coordinate geometry (COGO) – is one of the preferred methods for calculating coordinate points from surveys and can be used to update the city limit boundaries. These boundaries should adhere to the specifications of CAPCOG’s QC systems and have no gaps or overlaps within a topology tolerance of +/- 3 feet in the GIS within +/- 3 feet of their true location with no gaps or overlaps.[HA3]

6.36.2 Database Format

The following table details the data format requirements for the Municipal Boundary database.

Table 6-1. Municipal Boundary Database Format

FIELD NAME	M/C/O	TYPE	WIDTH	DESCRIPTION/ VALID ENTRIES
SOURCE	M	TEXT	75	Agency that last updated the record, i.e. CALDWELL, LLANO
PROVIDER	M	TEXT	75	The name of the regional 911 authority <i>CAPCOG will populate</i>
LAST_MOD	M	DATE	26	Date of last update using ISO 8601 format
EFF_DATE	O	DATE	26	Date the new record information goes into effect in ISO 8601format
POLY_ID	O	LONG	DEFAULT	Numeric Polygon ID <i>CAPCOG will populate prior to uploading to PSAP. May also serve as a placeholder field to populate MUNIUNQID field</i>
MUNIUNQID	M	TEXT	100	Globally Unique ID for each municipality - . Ex. 9847INCM@austintexas.gov
COUNTRY	M	TEXT	2	Country name represented by two capital letters
STATE	M	TEXT	2	State Name (eg: TX)
COUNTY	M	TEXT	40	County name fully spelled out
MUNI_NM	M	TEXT	100	Name of municipality i.e. "AUSTIN"

7 Automatic Location Identification (ALI)

The ALI database consists of landline telephone numbers that have associated location information attributed to them. In order to have these call types route to the proper PSAP and plot to the correct location on a call taker’s map display, the attributes of the data must be correct and must match the road centerline (RCL) and address point feature classes (SSAP).

The performance standard for the ALI database is Aa 98% match rate between the ALI database and both the RCL and SSAP datasets. ~~is the current CAPCOG and vendor performance requirement.~~ This means that 98% of a local jurisdiction’s ALI database should match to both a road centerline feature and address point feature.

7.1 Edits

Match errors between these datasets that are returned by the quality control systems should be reviewed and corrected accordingly. This could mean either by making corrections to the GIS data or by providing suggested changes to the ALI database. The ALI data are not owned by CAPCOG or PUBLIC AGENCY, but instead by telephone service providers. Suggested edits to the ALI databases should be made by providing Change Requests (CR) via the Intrado 911Net or GIS Director applications

7.2 Database Format

The following fields in the ALI database are used by the Data Hub and EGDMS quality control systems to match the address point and road centerline feature classes to ensure a call routes and plots correctly.

Table 7-1. ALI Database Format

<u>FIELD NAME</u>	<u>CORRESPONDING RCL OR AP FIELD</u>
<u>HOUSE NUMBER</u>	<u>LT_ADDR, LF_ADDR, RT_ADDR, RF_ADDR, ADDR_NUM</u>
<u>HOUSE NUMBER SUFFIX</u>	<u>ADDRNUM_SUF</u>
<u>PREFIX DIRECTIONAL</u>	<u>PRE_DIR</u>
<u>STREET NAME</u>	<u>ST_NAME</u>
<u>COMMUNITY</u>	<u>L_MSAG_COM, R_MSAG_COM, MSAG_COM</u>
<u>ESN</u>	<u>ESN</u>
<u>STATE</u>	<u>STATE</u>

**CAPITAL AREA EMERGENCY COMMUNICATIONS DISTRICT
BOARD OF MANAGERS MEETING**

MEETING DATE: October 13, 2021

AGENDA ITEM: #8 Consider Approving Appointments to Advisory Committee

GENERAL DESCRIPTION OF ITEM:

This is the monthly item for filling positions on our Advisory Committee; please let us know if our staff can assist in identifying interested persons to serve. It is presumed that both city and county representatives will collaborate when making appointments.

THIS ITEM REPRESENTS A:

- New issue, project, or purchase
- Routine, regularly scheduled item
- Follow-up to a previously discussed item
- Special item requested by board member
- Other

PRIMARY CONTACT/STAFF MEMBER: **Deborah Brea, Executive Assistant**

BUDGETARY IMPACT:

Total estimated cost: N/A

Source of Funds: N/A

- | | | |
|---|------------------------------|-----------------------------|
| Is item already included in fiscal year budget? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Does item represent a new expenditure? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Does item represent a pass-through purchase? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
- If so, for what city/county/etc.? _____

PROCUREMENT: N/A

ACTION REQUESTED:

Approve any advisory committee recommendations.

BACK-UP DOCUMENTS ATTACHED: None

BACK-UP DOCUMENTS NOT ATTACHED *(to be sent prior to meeting or will be a handout at the meeting):*

1. Executive Committee attendance roster
2. Advisory Committee attendance rosters