

# Lessons Learned in the 2020 Redistricting Term – CRC Data Team: Dynamics and Considerations for 2030

Paul Mitchell, Data Analyst – July 2022 (Public Input classes updated June 2023)

## INTRODUCTION

During the 2020 Redistricting term, CRC's Data Team successfully processed and made available over 36,000 digital and digitized records of public input comment, and as well developed and deployed web-based interactive map viewers for draft and final district map plans. This paper primarily documents the 2020 work, methods, and roles of CRC's Data Team. Specific challenges to our work are listed and solutions are offered. However, most of these items are particular to the current circumstances and represent traces of the complex dynamics at play in redistricting project work. In considering the future 2030 term, some of these task-related challenges will be outdated by advances in technology and methods of working within this subject area – however CRC's purpose will continue to rest on the fundamental need to collect public input and incorporate that comment into district map plans; data use and management will continue to play an important role in accomplishing CRC's responsibilities.

## PRIMARY RECOMMENDATIONS for 2030

Opportunities exist for improvement within data management, data communications, and relationship dynamics at CRC. The 2020 redistricting term exposed a continued need to: 1) strategically classify public input comment, 2) establish & maintain a geospatial COI database, and 3) design a data workflow that enables Commissioners access and opportunity to translate public input into actionable line drawing practices. Additionally, a calculated data management strategy which clearly identifies project deliverables, criteria, and specifications for contractors and Data Team staff through all phases of the Commission's term is desirable.

### 1. CLASSIFYING PUBLIC INPUT COMMENT

CRC welcomes, solicits, and receives a high volume of public input comment – *but what is this input, and how can we analyze it?* While CRC's Data Team delivered for the first time a string based searchable and sortable dashboard/interface table of public input (embedded in the CRC website via Airtable) -- this database was not easily mined or analyzed beyond basic geographic associations and simple sorting functions. Patterns and trends in Public Input were not easily identified, primarily due to an inability to perform advanced query, summary, and grouping operations.

*A standardized strategic classification of the public input comments should be a required work product criteria of the CRC Public Input database in order to accomplish successful data analysis and querying practices based upon social, economic, and district geographic attributes. Classes should be researched and determined well in advance of the Redistricting Term – in 2020 we began classifying midstream and in a laissez faire manner which resulted in unusable and inconsistent classes.*

Developed after the districts were generated (February – April 2022), Appendix 1 of this document offers a classification scheme based upon the great variety of Public Input comment received in 2020 – these classes capture social and economic interests (district geographic characterizations are included within the social interests). A second tier of umbrella classes is also listed for example and consideration. This Appendix may be viewed as a guide, foundation, or indeed a usable classification for the 2030 term.

The U.S. Census Bureau (e.g. population, demographic, and economic censuses), ANSI, and other classification agencies might offer additional guidance for developing more class schemes – however the values associated with a citizen’s redistricting commentary are unique to the practice and will remain specific to the subject area (i.e. CRC likely will need to formulate their own classification system to accommodate certain types of comment). The temporal shift in public input comment should as well not be overlooked in classification methodology – while the term begins with the receipt of vague COI and general interest comment, it quickly accelerates into pointed direct and highly detailed district plan comment as draft district mapping progresses.

## 2. DEVELOP A COI GEOSPATIAL DATABASE

A high value product (and now CRC asset) of the 2020 term was the mapping of COIs (Communities of Interest). Delivered in digital geospatial format through the web-based and open source Draw My Community tool – the resulting COI maps and data should be viewed as unprecedented in their importance, value, and potential use for California’s recent and future redistricting needs (and possibly including future local city, county and other locality redistricting uses between CRC’s redistricting terms). It is surprising that collaborative uses and multi-agency needs haven’t already been considered.

Presumably due to the redistricting term’s tenure and lifespan, the COI tools and data management approach developed for 2020 were singular in nature: the express goal of delivering individual boundary files for viewing purposes -- without consideration for general data administration, administrative batch delineation of redundant COI submitted as comment, spatial analysis, or archiving for future uses, editing, and additions.

The development of a geospatial COI database from the existing COI files would provide an extremely beneficial resource for CRC and the State of California. Just as the U.S. Census Bureau maintains geographic and statistical area boundary files for repeatable and future data needs – California’s COI boundaries are entirely unique to the state and otherwise undocumented. A COI database would provide a foundation for the 2030 term in the form of existing boundaries that, through relational database technology, could be assigned to future public input comment rather than creating redundant boundary files for each COI comment received. The benefit of this approach can’t be understated as the public could simply identify and select their COI(s) -- COIs would thusly be associated with numerous public input records and inversely a single record could be associated with multiple COIs (e.g. economic, cultural, neighborhood). From an analytical perspective, the CRC Data Team would avoid the pitfalls of topological errors associated with overlaying identical polygon map files during spatial analyses. This would open a great opportunity to more efficiently determine density, proximity, and extent of overlapping properties of multiple COI.

Additionally, an established and maintained COI database would provide the general public and State with an ongoing living geographic reference to their COIs which may serve as reference and statistical models elsewhere. State Archives might serve as a repository for this database between redistricting terms.

## 3. DEFINE DATA WORKFLOW & RELATIONSHIP DYNAMICS

Redistricting is a complex practice – it includes an intensely compressed timeline, the application of abstract geographic concepts, and the incorporation of numerous voices and organizations toward a

common goal. Data management and analysis is intended to ameliorate these complexities. Yet without start-to-finish guidelines and role setting – data workflow and collaboration opportunities between team members become ambiguous and less fruitful. Influential decision-making might occur during one phase of redistricting (e.g. start-up) only to leave agents of redistricting scrambling in a later phase (e.g. close-out).

Challenging questions arise:

*How is public input data accessed? How does the public find record of their input? How do Commissioners relay public input to line drawers? How is data analyzed? Who accomplishes analyses? What kind of analysis can we accomplish? Who is responsible for delivering metadata? How does CRC confirm the incorporation of public input to district mapping plans? Etc.*

These types of questions arise throughout the phases of a redistricting term. A 2030 term should consider solutions to these types of ambiguous situations. In one form or another, data workflow and relationship dynamics should be defined and managed during the *Start-up* phase: criteria for work products and deliverables should be detailed and follow industry standards, production control systems should be considered, and temporal working relationships should be clearly defined.

*Attached* is a draft conceptual schematic for the Data Team's role in 2030, across all phases of the CRC's term, start-up through close-out (Data Team and data management tasks are shaded brown and orange). It is recommended that a CRC Data Team staff be incorporated early in the work of the Commission. This would allow staff to help clarify deliverable criteria and be involved with initial data management decisions that may determine and influence the ease and accessibility of data throughout all phases. During the *Execution of the Plan* phase it is recommended that a Data Team staff member work more closely with Commissioners and Line Drawers to assist with data analysis guidance. Ideally this staff member would have skill in both geographic and tabular data analysis.

## **CONTEXT AND SETTING**

During the 2020 Redistricting Term, the CRC Data Team ingested, processed, and prepared spatial and non-spatial public input for the Commission. The Data Team was staffed during the late summer of 2021, designed and integrated data management & GIS software tools during the fall months of 2021 and maintained accessibility to Public Input databases and interactive maps of the draft districts throughout November and December -- until the final district boundaries were certified in late December of 2021. This was a compressed timeline which required Data Management staff to carry out most tasks simultaneously (e.g. data ingestion, database design, and interactive database accessibility deployment). Due to the Coronavirus pandemic, the Data Team worked remotely from multiple locations throughout the entirety of the 2020 term.

Public input included the mapped COI (community of interest) delineations, social/cultural interests comment, economic interests comment, and district mapping comment (formats included Esri and Maptitude block equivalency files as spatial data submissions, attachments as pdf, image, and Microsoft Word files). Additionally, the CRC Data Team developed and deployed interactive webmaps using Esri's ArcGIS Online software to present and share district boundaries in draft, iteration, and final format (Webmaps were updated during November and December on a near daily basis to accommodate rapidly updated district boundaries coming from the line drawers).

In essence there were two concurrent data streams which the CRC Data Team was working: 1) district delineations and 2) public input ingestion. The connectivity between these two data streams was limited primarily due to responsibilities and roles established during the Start Up phase of the Commission's redistricting work. Notably the role and ability to incorporate public input into the creation of district boundaries was ambiguous at best; a workflow to specifically address COI spatial delineations contribution to district boundaries was not established from my perspective.

These notes offer documentation, observations, and some suggestions for the CRC Data Team through the five phases of the CRC's work and I found it reasonable to suggest that a member of the Data Team be part of the CRC's work from the beginning of the Commission's work:

1. Start-Up
2. Planning
3. Execution of the Plan
4. District Generation
5. Close-Out

## **START-UP and PLANNING**

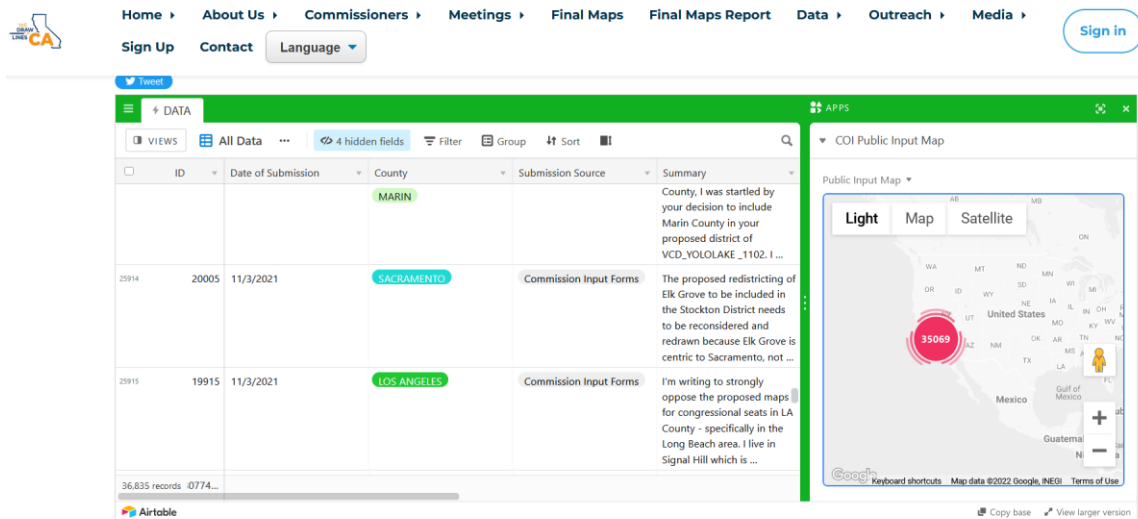
The data team had not been assembled and did not contribute to Start-Up and Planning phases of the 2020 redistricting term. However, contractors and CRC administration undertook and moved forward with several very influential data projects that would determine interactivity and responsibility for data generation and data management, and to some degree the relationship dynamics between the Data Team and redistricting entities (including the line drawers and Commission). The data projects begun before CRC Data Management staff were hired included: developing desktop and interactive mapping tools for generating COIs and district plans (e.g. *Draw My Community* tools), establishing line drawing methods and tools, and as well intaking public input (e.g. Airtable and Amazon Web Services storage for

COI shapefile submissions). These tools and dataflow concepts were carried out by the Statewide Database organization and several private contractors some of which confusingly were some of the people (e.g. Statewide Database and Q2).

While the framework and some of the toolsets were initiated before Data team staff came on board, workflow gaps as well as opportunities existed within the delivery of data to the Commission and general public. From my view the crucial framework and data flow details for incorporating public input into district creation and supporting the Commissioners accessibility and knowledge of public input was ambiguous in principle and practice for the Data team and Commissioners. For this reason, I'd recommend CRC consider having a Data Manager with GIS/spatial data knowledge present during the Start-up and Planning phases to allow for establishing the role of CRC Staff and helping to design data development, delivery, workflow and relationships/guidance to the Commission and line drawing teams, rather than spontaneous creativity during the actual and extremely compressed district delineation period.

During the 2020 term, Commissioners and the general public would eventually access the Public Input database through an Airtable tabular interface and dashboard embedded within the CRC website (a screenshot is below this paragraph as Figure 1). A pin style interactive map was inset within the Airtable dashboard for a limited degree of spatial cognition and geographic accessibility to COI submission geography (as users zoomed in clusters of pins would appear, clicking on these records generated pop-ups to access the records). Commissioners browsed and would analyze Public Input records by sorting and scrolling thru submissions, a tedious task that included the cumbersome loading 36,000 records, records often loaded with various supporting attachments. These points will be addressed further in the *Execution of the Plan* section.

Figure 1. Embedded Airtable interface/dashboard



## PROBLEMS AND RECOMMENDATIONS

Below are a few examples that required rigorous manual data work and absorbed much of the Data Team's time and as well influenced relationship dynamics between the Commission and it's access to data:

## 1. COI Tool –

The COI tool was built specifically to allow *the public* to submit their COI one record at a time in a spatial (i.e. mapped) format, without consideration for data analysis or batch delineation requirements CRC Staff would later need. The notion that the same COI may be submitted numerous times does not seem to have been considered, yet the Data Team would encounter and delineate the same COIs numerous times and receive redundant COI delineations in order to process and ingest all public input. The contractors' management of the COI tool and the Data Team's compressed timeline prevented the Data Team from recognizing this bottleneck, accessing the tool's developers, and requesting the simple ability to copy a COI submission. As a result, the Data Team would routinely repeat work tasks to fit within the data model and workflow devised by the contractors.

*SOLUTION: COI copy tool or a batch delineation tool that simply relates multiple COI records to a unique COI delineation. (A COI database in which COI boundaries are related to Public Input records rather than redundantly delineated would be a wiser option.)*

## 2. Batch COI Download --

Access to COI submissions shapefiles was difficult. COI submissions were saved as individual records and the shapefiles generated by the COI tool were saved individually in compressed zip files. A batch download for data management or data analysis needs was unavailable and difficult to communicate to the contractors.

*SOLUTION: COI Batch Download or more wisely a batch delineation tool that simply relates multiple COI records to a unique COI delineation.*

## 3. Topology Errors --

In attempting to intersect multiple COI shapefiles, topology errors were routinely encountered which prevented effective spatial analyses from occurring (Indeed intersecting multiple versions of the same delineation is a recipe for topology errors).

*SOLUTION: Troubleshoot software shapefile output for topology errors and attempt spatial analyses with output shapefiles. (A COI database in which COI boundaries are related to Public Input records would reduce the redundant delineations of the same COI as well.)*

## 4. Metadata --

Metadata was not available for any data products planned or developed during the Start-up and Planning phases. CRC should detail, expect, and hold contractors as well as CRC Staff accountable for providing metadata to any finalized data products. Metadata is a crucial currency when exchanging or archiving datasets.

*SOLUTION: Metadata is an industry standard component of data management. Metadata should be clearly stated as a required deliverable in all contracts.*

## 5. Analysis --

Analytical interests were not specified and ambiguous. In reality, analytical decisions were occurring regularly by the Commission, the Data Team, and the Line Drawers themselves to determine usefulness

and applicability of public input received, data conversions, and presumably qualitative influence toward the demographic and population shifts of actual line drawing.

*SOLUTION: Identify analytical interests and design workflow as well as systems that deliver the analytical results required for District delineations.*

## **EXECUTION OF THE PLAN**

This phase occurred from September through December 2021. With the Data team assembled and hired during late summer, we dove right into the redistricting project (the Data Analyst started in mid-July 2021 & the Data Manager started in August 2021). We were responsible for ingesting ever changing public input which arrived in multiple data formats, and in-return to standardize and deliver this same public input in a digital web-based deployment to the Commissioners and general public.

Initially public input arrived commonly as COI submissions, COI comment, generalized redistricting interest and suggestions related to district boundaries. When district plans were generated by the Commission during late October/early November – public input quickly shifted to highly specific district comment, often in geographic terms: spatial extent and distribution, incursion, exclusion, spatial connectivity, discontiguity, etc. All of these Public Input records were processed, standardized, and included within the same Airtable database and made available by the embedded Airtable interface/dashboard as described in the previous section.

The need for presenting the district plans (i.e. the mapped district delineations) in an interactive webmap form also became apparent in October. While contracted line drawing teams and the Statewide Database team generated district plans, the means to share these plans beyond static maps, and downloadable spatial data didn't appear to have been considered – and the CRC Data team filled the need by designing and developing an interactive webmap within a week of the first draft plans being developed.

We launched our first interactive district map with the ArcGIS Online webmap toolsets in early November; during November and December the interactive map would feature iterations, drafts and final versions of the districts for Congressional Districts, Assembly Districts, State Senate Districts, and Board of Equalization Districts – along with auto-labeling county and place layers (incorporated places and CDPs). Figure 2 below offers a screenshot of the interactive map. Users could toggle district plans on and off, as well as click directly on district layers which opened a pop-up bubble of select population and demographic attributes (Figure 3).

Figure 2. Interactive district plan webmap

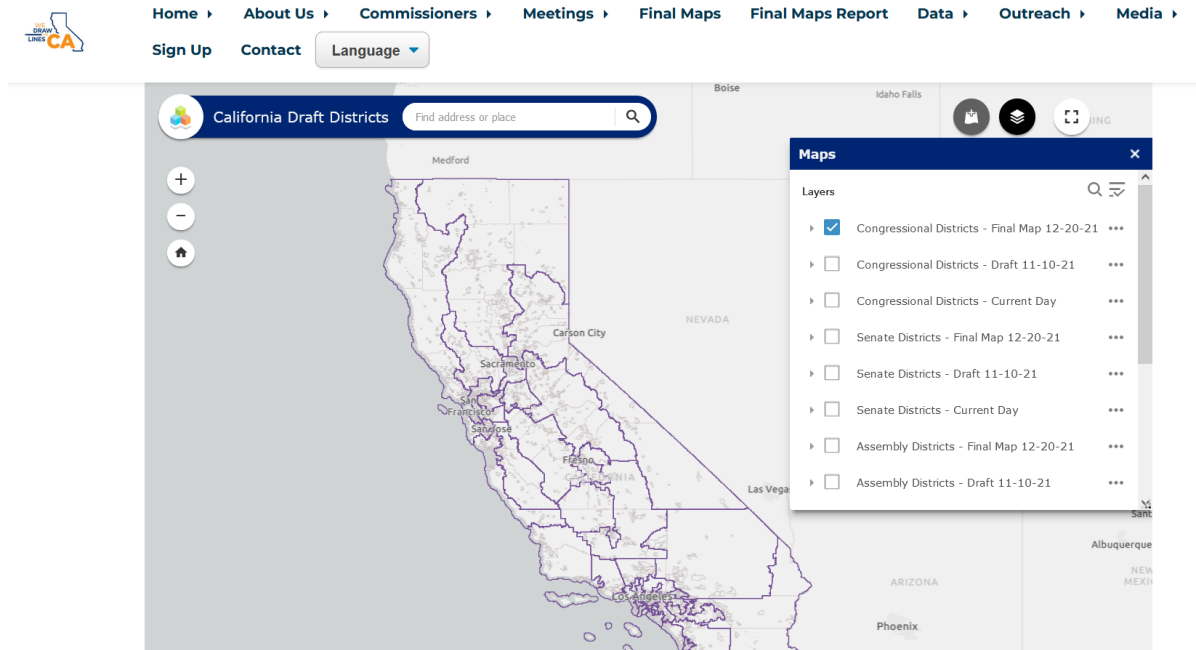
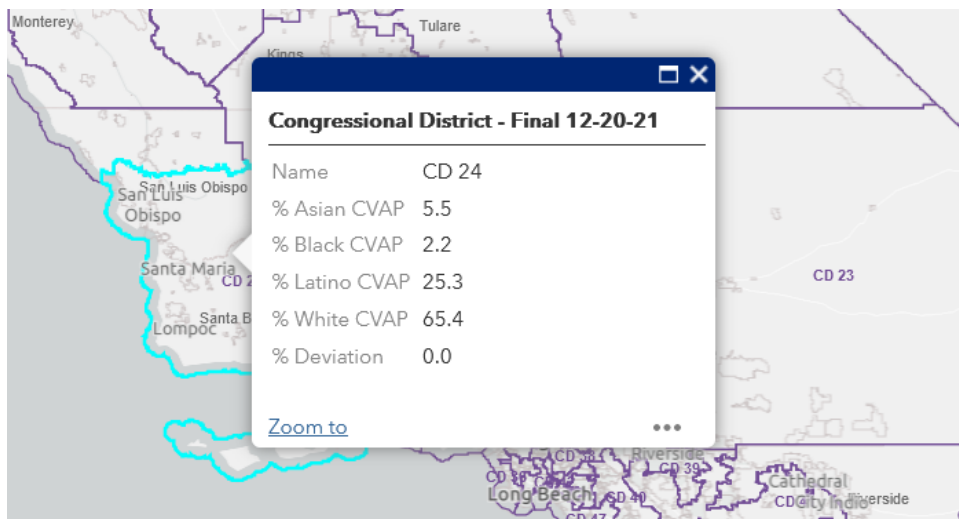


Figure 3. Detail screenshot of an example pop-up offering population and demographic attributes of the selected district.



### THE PUBLIC INPUT DATABASE

As noted above -- records of public input were accessed by the Commissioners and general public through an embedded tabular Airtable interface. Again, it is noted, the eventual tally of over 36,000 records of public input (which included a wide variety of related attachments: pdfs, documents, compressed spatial data, images, tables, etc.) -- had limited interactive functionality: a basic string search tool was built into Airtable, and users could scroll, or sort records by fields and then click on attachments.



In September the need to classify Public Input had become apparent. The Data Manager added *Social Interest* and *Economic Interest* fields to the Airtable database, as these “interests” were generally the most common received by CRC. The Data team (Data staff including several student assistants) and later the general public (via Public Input form) populated these fields in a freewheeling manner; staff and public users could create interest classes spontaneously or make use of existing classes (including misspelled and erroneous class labels).

As a result, these class fields were inconsistent, error ridden, and not particularly useful. Yet an organized and better planned classification of the Public Input records is likely to yield the easiest means to mine and identify the CRC database in future redistricting efforts. During the Close-Out phase in the winter months of 2022, after district certification, the Data team invested a large amount of time attempting to create classes that could be used in 2030. These class fields are included in Appendix 1 at the end of the document.

While alternative sources such as the Census Bureau, including Economic Census studies, and ANSI classifications may offer some guidance to creating these types of classes – one must consider the potpourri of Public Input that CRC receives during the redistricting period. Comment may include any aspect of cultural, social, economic, political, and governmental life – and as seen within the added abstract lense of district geography and spatial organization.

#### *PROBLEMS AND RECOMMENDATIONS*

##### 1. Public Input Data Classes --

Data classifications were improvised and inconsistent throughout our data processing and database development. We began classifying data in the midst of Public Input collection in an unorganized manner lacking methodology. This prohibited data mining and the capabilities of the Public Input datasets from being fully leveraged.

*SOLUTION: Arrive with a plan for data classification. Consider the wide variety of public input and comment that will be received by CRC. Make use of our experience and classification ideas as shared in Appendix 1 of this document. Leverage the public comment datasets with queries and dataflow based upon the classifications. Design database tools and accessibility upon data classifications.*

##### 2. Public comment and data guidance --

The public was free to comment and class their comments with any words or style. This was problematic as spelling errors and erroneous entries became part of the dataset and were utilized by both staff and the public to describe their comment and format Public Input. Additionally, without classifying data there was no means for CRC staff, Commissioners, or the public to coherently query and analyze the public comment.

*SOLUTION: Provide some guardrails for protecting the value of the data and consider database and dashboard tools that can be used to query and mine CRC public comment data. Design public comment forms that steer the public into making use of data classes which can be utilized by Commissioners to identify and clearly understand the salient points being made by the public comment. Make use of our experience and classification ideas as shared in Appendix 1 of this document.*

*Develop workflow and relationship dynamics that foster opportunities and database/data dashboard tools that Commissioners may use to clarify how their decisions will be integrated into line drawing.*

## **DISTRICT GENERATION**

Districts were generated primarily during November and December 2021. The Data Team's role was to continue ingesting, processing, and refining public input comment within the Airtable databases and the near daily update and maintenance of the interactive web-based map viewers (to account for updated drafts and eventually the final plans). Public Input comment was overwhelmingly directed at specific boundaries and district geography at this time (i.e. very few new COI were being received, and we had time to delineate earlier COI comments). Our interactions with the Commission were limited, and how the integration of Public Input comment was prioritized and communicated to Line Drawers was unclear. A refining of the map viewer allowed Commissioners and the general public to drag-and-drop geospatial layers, such as COI or district map plans directly into the map viewer which I believe served a crucial spatial overlay purpose to address specific line drawing problems.

Refining public input included the tedious task of redacting and reviewing contact information and other comment attributes considered inappropriate, threatening, or requiring additional legal considerations (Voting Rights Act, etc.). Redacting was accomplished manually in shifts throughout the day by all members of the Data Team staff – our production control system was simply an added checkbox field within Airtable. New records would populate within the public facing embedded Airtable interface as redactions were accomplished. Due to the round-the-clock line drawing work occurring in the final weeks it was extremely difficult for redacting activity to keep up with the Commission's pace and needs. It is certain that some comments were not delivered in a timely manner for the Commissioners to review.

Updating the interactive map viewers required renaming and organizing file names and formatting attributes for usability. Files were received from line drawers erratically without schedule – which required a hurry-up-and-wait approach for CRC staff. Once received, the preparation of district map files was accomplished with ArcGIS desktop software – boundaries were then uploaded to CRC's ArcGIS Online account, converted and deployed as a web-based map service, and finally added to the map viewer where layer symbologies and district pop-ups were formatted and set.

Data Team staff additionally developed textual boundary feature files for the development of audio files describing the districts for ADA compliance.

## **PROBLEMS AND RECOMMENDATIONS**

### **1. Redaction --**

Redacting public comment proved to be a time consuming and tedious manual task. We read through every comment, identified PII (personally identifiable information) for redaction, and assessed content for threat, inappropriate comment, or legal sensitivities such as VRA. Primarily this was a time consuming task that prevented timely dissemination of pertinent comment during the final weeks of district generation.

***SOLUTION: Determine redaction requirements early, define what qualifies or requires redaction. Can user terms be set that allow comment to immediately be shared with the public?***

## 2. District Plan Attribute Formatting and District Plan Metadata --

District plans were delivered by line drawers regularly without consistent attributes and without attribute definitions – which were explained informally over email. Because of the urgency associated with posting district plans to our map viewers, the lack of attribute metadata was not ideal.

*SOLUTION: Attribute metadata (as noted earlier) is an industry standard – criteria for deliverables should be identified and determined before urgent work is required. On the fly guess work should be avoided when posting data publicly (as was the case with the district map viewers for instance).*

## 3. Sticking to schedules --

Plans from line drawers were received with urgency; our intent was to post updated district plans within an hour of receipt. While a schedule was initially set for the delivery of district plans, it was never followed and become a constantly shifting ambition, that may occur anytime of the day, and on any day.

*SOLUTION: Set realistic schedules and expectations early. After missing deadlines, utilize all communications available to clarify when district plans will be made available.*

## 4. Analytical objectives --

It was difficult to ascertain how public input comment was prioritized and incorporated into district plans, e.g. the working relationship between Commissioners and line drawers. This may simply have been the result of remote work during the pandemic. Presumably in 2030, some tasks will continue to be accomplished remotely and decentralized as redistricting meetings occur across a state with the size and population of California and tasks are accomplished from multiple locations. *One is left to wonder how data management and data analysis resources are utilized in this style of project work – can formalized production control systems be used to inform all parties of task completion? What is the ideal role for the Data Team in this context; are Commissioners being adequately supported by the Data Team?*

*SOLUTION: Plan for and determine data workflow and relationship dynamics. Set data analysis objective. Allow enough time and opportunity for CRC Staff to work with the Commission. Consider using production control systems accessible by staff and commissioners, and possibly with public observation. Data Team staff utilized Slack and Notion web-based software to informally communicate and message (often in missive style) task and project management metrics.*

## CLOSE-OUT

The final phase of the 2020 term for the Data Team has involved making CRC's databases available, portable, and usable to those of interest. These parties have specifically included the general public, State Archives, and media interests.

In summary, CRC's databases have included tabular formatted digital data with numerous electronic attachments of all styles and formats – to include pdf documents, compressed geospatial data (e.g. \*.zip), image files (e.g. \*.jpg). Attachments may be descriptive textual letters and notes, scanned 'paper COI', or images of district map plan proposals, etc. The COI tool generated compressed geospatial data as well as graphic maps of the same COI in pdf format; geospatial data and pdf maps have been stored

with Amazon Web Services. All other attachments were saved within Airtable fields. Data and attachments together are less than 20 GB, yet reside in different frameworks, accessibility, and location.

Assembling this array of data and attachments into a portable and transferrable format has not come with ease. Advanced data engineering skill sets and tools are required to accomplish the task, particularly as access to some portions of this data will likely be through web-based user interfaces that third parties will maintain during CRC's dormancy until the next term begins. State Archives as well is not prepared to accept and maintain a living database of these types. We continue to work with contractors and State Archives to determine data formats and data types that may be made available.

#### *PROBLEMS AND RECOMMENDATIONS*

##### 1. Defined deliverable criteria --

A clear definition of how CRC's work products may be archived and exported for public distribution should be considered at the outset, in the same determination of choosing data storage and toolsets used for accomplishing CRC's work.

*SOLUTION: Determine in the start-up/planning phases desired deliverables and final work products – set criteria and definitions for deliverables that consider ease of access, exporting, and transferring to the public and State Archives. Identify storage and tools that offer flexibility for exporting. Work with partners to identify their desired work products; use these requests to inform criteria for deliverables.*

##### 2. Define data workflow and relationship dynamics --

*SOLUTION: Incorporate Data Team staff during the initial phases of CRC's work so that they may inform and help guide data workflow from start to finish, clearly working toward deliverables. Consider the skill sets needed to accomplish this work. A dedicated data engineer on staff likely would help the Data Team.*

**Appendix 1. Public Input Classifications**

**SOCIAL INTERESTS and DISTRICT GEOGRAPHY**

<b>Class III</b>	<b>Class II</b>	<b>Class I</b>
<b><i>I. LANDS, WATER, and ENVIRONMENTAL CHARACTERISTICS</i></b>		
Environmental Hazard (General)	Environmental Hazards	Lands, Water, & Environmental Characteristics
Air Pollution	Environmental Hazards	Lands, Water, & Environmental Characteristics
Water Pollution	Environmental Hazards	Lands, Water, & Environmental Characteristics
Toxic Pollution	Environmental Hazards	Lands, Water, & Environmental Characteristics
Wildfire	Environmental Hazards	Lands, Water, & Environmental Characteristics
Climate Change	Environmental Hazards	Lands, Water, & Environmental Characteristics
Sea Level Rise	Environmental Hazards	Lands, Water, & Environmental Characteristics
Coastal Environment (Bluffs)	Environmental Hazards	Lands, Water, & Environmental Characteristics
Coastal Environment (Oil Contamination)	Environmental Hazards	Lands, Water, & Environmental Characteristics
Coastal Environment (Port pollution)	Environmental Hazards	Lands, Water, & Environmental Characteristics
Climate and Landforms	Land Characteristics	Lands, Water, & Environmental Characteristics
Coastal	Land Characteristics	Lands, Water, & Environmental Characteristics
Forest	Land Characteristics	Lands, Water, & Environmental Characteristics
Desert	Land Characteristics	Lands, Water, & Environmental Characteristics
Urban Land	Land Characteristics	Lands, Water, & Environmental Characteristics
Rural Land	Land Characteristics	Lands, Water, & Environmental Characteristics
Open Space	Land Characteristics	Lands, Water, & Environmental Characteristics
Farmland (General)	Land Characteristics	Lands, Water, & Environmental Characteristics
Farmland Productivity	Land Characteristics	Lands, Water, & Environmental Characteristics
Public land (General)	Land Management	Lands, Water, & Environmental Characteristics
Private land (General)	Land Management	Lands, Water, & Environmental Characteristics
Parks (General)	Land Management	Lands, Water, & Environmental Characteristics

Parks (Local and State)	Land Management	Lands, Water, & Environmental Characteristics
National Parks	Land Management	Lands, Water, & Environmental Characteristics
National Forests	Land Management	Lands, Water, & Environmental Characteristics
Land Conservation and Protection	Land Management	Lands, Water, & Environmental Characteristics
Coastal Environment Protection & Restoration	Land Management	Lands, Water, & Environmental Characteristics
Invasive Species and Control	Land Management	Lands, Water, & Environmental Characteristics
Water (General)	Water Resources	Lands, Water, & Environmental Characteristics
Watershed	Water Resources	Lands, Water, & Environmental Characteristics
Water Supply	Water Resources	Lands, Water, & Environmental Characteristics
Groundwater	Water Resources	Lands, Water, & Environmental Characteristics
Lakes and Reservoirs	Water Resources	Lands, Water, & Environmental Characteristics
Rivers	Water Resources	Lands, Water, & Environmental Characteristics
Coastal, Harbor, and Port Waters	Water Resources	Lands, Water, & Environmental Characteristics
Sea, Ocean, Marine Resources	Water Resources	Lands, Water, & Environmental Characteristics
Wildlife (General)	Wildlife	Lands, Water, & Environmental Characteristics
Sea and Ocean Species	Wildlife	Lands, Water, & Environmental Characteristics
Fish	Wildlife	Lands, Water, & Environmental Characteristics
Game	Wildlife	Lands, Water, & Environmental Characteristics
Open Range	Wildlife	Lands, Water, & Environmental Characteristics
Domesticated	Wildlife	Lands, Water, & Environmental Characteristics
Invasive Species and Control	Wildlife	Lands, Water, & Environmental Characteristics
Wildlife Management and Conservation	Wildlife	Lands, Water, & Environmental Characteristics
<b>II. DISTRICT GEOGRAPHY</b>		
Redistricting Process and Methods	District Geography	<i>District Geography</i>
Historical/Traditional District Geography	District Geography	District Geography
Contiguous	District Geography	District Geography
Discontiguous	District Geography	District Geography
Extent	District Geography	District Geography

Connectivity (General)	District Geography	District Geography
Connectivity (City/Town/Community)	District Geography	District Geography
Connectivity (Neighborhood)	District Geography	District Geography
Split (City/Town/Community)	District Geography	District Geography
Split (Neighborhood)	District Geography	District Geography
District Shape	District Geography	District Geography
Gerrymandered	District Geography	District Geography
Obstacle (General)	District Geography	District Geography
Obstacle (Natural Feature)	District Geography	District Geography
Obstacle (Built Feature)	District Geography	District Geography
Isolation	District Geography	District Geography
Distance	District Geography	District Geography
Included	District Geography	District Geography
Excluded	District Geography	District Geography
Common Geography	District Geography	District Geography
<b>III. GOVERNMENT SERVICES AND INFRASTRUCTURE</b>		
Sustainability and Environmental Programs	Government Services and Infrastructure	Government Services and Infrastructure
Emergency Services	Government Services and Infrastructure	Government Services and Infrastructure
Natural Disaster Response & Recovery	Government Services and Infrastructure	Government Services and Infrastructure
Police Services/Law Enforcement/Corrections	Government Services and Infrastructure	Government Services and Infrastructure
Controlled Substance Management	Government Services and Infrastructure	Government Services and Infrastructure
Fire Protection Services	Government Services and Infrastructure	Government Services and Infrastructure
Wildfire Protection Services	Government Services and Infrastructure	Government Services and Infrastructure
Education and School Districts	Government Services and Infrastructure	Government Services and Infrastructure
Water and Irrigation Districts	Government Services and Infrastructure	Government Services and Infrastructure
Air Quality Districts	Government Services and Infrastructure	Government Services and Infrastructure
Court Services/Districts	Government Services and Infrastructure	Government Services and Infrastructure
Civil Rights & Equality	Government Services and Infrastructure	Government Services and Infrastructure
Policy & Legislation	Government Services and Infrastructure	Government Services and Infrastructure
Community and Regional Planning	Government Services and Infrastructure	Government Services and Infrastructure
Recycling/Waste Management	Government Services and Infrastructure	Government Services and Infrastructure

Sewer Districts	Government Services and Infrastructure	Government Services and Infrastructure
Transportation and Traffic Management (General)	Government Services and Infrastructure	Government Services and Infrastructure
Publicly Owned Utilities	Government Services and Infrastructure	Government Services and Infrastructure
Social Services (General)	Government Services and Infrastructure	Government Services and Infrastructure
Public/Environmental Health	Government Services and Infrastructure	Government Services and Infrastructure
Public Transit (General)	Government Services and Infrastructure	Government Services and Infrastructure
Public Transit (Bus)	Government Services and Infrastructure	Government Services and Infrastructure
Public Transit (Rail)	Government Services and Infrastructure	Government Services and Infrastructure
Infrastructure (General)	Government Services and Infrastructure	Government Services and Infrastructure
Government and Public Services (General)	Government Services and Infrastructure	Government Services and Infrastructure
<b>IV. ETHNICITY, RACE, MINORITY, &amp; RELIGION CHARACTERISTICS</b>		
Discrimination and Hate Crimes	Ethnicity, Race, and Minority	Ethnicity, Race, and Minority
LGBTQ+	Ethnicity, Race, and Minority	Ethnicity, Race, and Minority
Refugee Community	Ethnicity, Race, and Minority	Ethnicity, Race, and Minority
Immigrant Community	Ethnicity, Race, and Minority	Ethnicity, Race, and Minority
Language Access/Barriers	Ethnicity, Race, and Minority	Ethnicity, Race, and Minority
Religion & Faith Based (General)	Ethnicity, Race, and Minority	Ethnicity, Race, and Minority
American Indian/Native/Tribal	Ethnicity, Race, and Minority	Ethnicity, Race, and Minority
African American	Ethnicity, Race, and Minority	Ethnicity, Race, and Minority
Arab, Middle Eastern, Muslim, and South Asian	Ethnicity, Race, and Minority	Ethnicity, Race, and Minority
Asian American & Pacific Islander	Ethnicity, Race, and Minority	Ethnicity, Race, and Minority
Jewish Community	Ethnicity, Race, and Minority	Ethnicity, Race, and Minority
Latino/Hispanic	Ethnicity, Race, and Minority	Ethnicity, Race, and Minority
African American	Ethnicity, Race, and Minority	Ethnicity, Race, and Minority
African	Ethnicity, Race, and Minority	Ethnicity, Race, and Minority
European	Ethnicity, Race, and Minority	Ethnicity, Race, and Minority



Russian and East European	Ethnicity, Race, and Minority	Ethnicity, Race, and Minority
White (Non-Hispanic)	Ethnicity, Race, and Minority	Ethnicity, Race, and Minority
Ethnicity and Race (General)	Ethnicity, Race, and Minority	Ethnicity, Race, and Minority
<b>V. VOTING RIGHTS AND REPRESENTATION</b>		
Voting Rights Act	Voting Rights	Voting Rights and Representation
Voting Power	Voting Rights	Voting Rights and Representation
Voting Access	Voting Rights	Voting Rights and Representation
Fair Representation	Representation	Voting Rights and Representation
Political Affiliation	Representation	Voting Rights and Representation
<b>VI. COMMUNITY &amp; CULTURAL CHARACTERISTICS</b>		
Shared Resources/Interests/Values/Challenges	Community Characteristic	Community & Cultural Characteristics
Differing Resources/Interests/Values/Challenges	Community Characteristic	Community & Cultural Characteristics
History/Traditions	Community Characteristic	Community & Cultural Characteristics
Community Events/Facilities	Community Characteristic	Community & Cultural Characteristics
Quality of life	Community Characteristic	Community & Cultural Characteristics
Diversity	Community Characteristic	Community & Cultural Characteristics
LGBTQ+ Community	Community Characteristic	Community & Cultural Characteristics
Rural Community	Community Characteristic	Community & Cultural Characteristics
Suburban Community	Community Characteristic	Community & Cultural Characteristics
Urban Community	Community Characteristic	Community & Cultural Characteristics
Commuter/Bedroom Community	Community Characteristic	Community & Cultural Characteristics
Associated Industry/Business	Community Characteristic	Community & Cultural Characteristics
Agricultural Community	Community Characteristic	Community & Cultural Characteristics
Viticultural Community	Community Characteristic	Community & Cultural Characteristics
Port Community	Community Characteristic	Community & Cultural Characteristics
Labor and Farmworkers	Community Characteristic	Community & Cultural Characteristics
Military Community	Community Characteristic	Community & Cultural Characteristics

Tourist Community	Community Characteristic	Community & Cultural Characteristics
Senior Citizens & Retiree Community	Community Characteristic	Community & Cultural Characteristics
Youth Interests and Resources	Community Characteristic	Community & Cultural Characteristics
Veteran Community, Interests, Resources	Community Characteristic	Community & Cultural Characteristics
Incarcerated Persons and Population	Community Characteristic	Community & Cultural Characteristics
Community Development	Community Services	Community & Cultural Characteristics
Child Care and Child Resources	Community Services	Community & Cultural Characteristics
Community Services (General)	Community Services	Community & Cultural Characteristics
Churches and Religious Facilities	Community Services	Community & Cultural Characteristics
Retail/Dining/Grocery Services	Community Services	Community & Cultural Characteristics
Recreation	Community Services	Community & Cultural Characteristics
Arts and Related Creative Resources	Community Services	Community & Cultural Characteristics
Accessibility/ADA	Community Services	Community & Cultural Characteristics
News and Communications	Community Services	Community & Cultural Characteristics
Utilities and Energy	Community Services	Community & Cultural Characteristics
Hospitals (General)	Medical Access and Services	Community & Cultural Characteristics
Medical Access & Expenses	Medical Access and Services	Community & Cultural Characteristics
Environmental Health	Medical Access and Services	Community & Cultural Characteristics
Family Planning	Medical Access and Services	Community & Cultural Characteristics
Senior Care	Medical Access and Services	Community & Cultural Characteristics
Housing (General)	Housing	Community & Cultural Characteristics
Housing Affordability	Housing	Community & Cultural Characteristics
Rental/Renter Interests	Housing	Community & Cultural Characteristics
Home Ownership	Housing	Community & Cultural Characteristics
Housing Development	Housing	Community & Cultural Characteristics
Population Density (General)	Population & Demographics	Community & Cultural Characteristics
Low Population Density	Population & Demographics	Community & Cultural Characteristics
High Population Density	Population & Demographics	Community & Cultural Characteristics
Population	Population & Demographics	Community & Cultural Characteristics
Demographic Similarities	Population & Demographics	Community & Cultural Characteristics
Demographic Differences	Population & Demographics	Community & Cultural Characteristics

Demographics (General)	Population & Demographics	Community & Cultural Characteristics
Income Disparities/Economic Hardships	Socioeconomics	Community & Cultural Characteristics
Low Income	Socioeconomics	Community & Cultural Characteristics
Middle Income	Socioeconomics	Community & Cultural Characteristics
High Income	Socioeconomics	Community & Cultural Characteristics
Employment and Economic Conditions	Socioeconomics	Community & Cultural Characteristics

## ECONOMIC INTERESTS

Class II	Class I
<b><i>ECONOMIC PURSUITS/BUSINESS INTERESTS</i></b>	
Coastal Industries (General)	Location Based Economic Interests
Rural Industries (General)	Location Based Economic Interests
Urban Industries (General)	Location Based Economic Interests
Agriculture (General)	Agriculture
Agriculture (Crop)	Agriculture
Agriculture (Cannabis)	Agriculture
Agriculture (Viticulture)	Agriculture
Agriculture (Cattle, Dairy, Ranching)	Agriculture
Agriculture (Livestock - Chicken & Feedlot)	Agriculture
Agritourism	Agriculture
Fishing/Shellfish/Aquaculture	Fishing/Shellfish/Aquaculture
Forestry	Forestry/Mining
Mining	Forestry/Mining
Energy (Oil & Gas)	Energy
Energy (Green & Renewable)	Energy
Energy (Transmission)	Energy
Retail (General)	Retail
Retail (Grocery)	Retail
Retail (Services)	Retail
Retail (Cannabis)	Retail
Retail (Alcohol)	Retail
Shipping/Transport (Land)	Shipping/Transport
Shipping/Transport (Air)	Shipping/Transport
Shipping/Transport (Sea)	Shipping/Transport
Warehouse/E-Commerce/Distribution	Shipping/Transport
Professional Services (General)	Professional Services
Financial Services	Professional Services
Technology Industries	Professional Services
Research/Development/Scientific	Professional Services
Healthcare	Professional Services
Senior Care and Retirement	Professional Services
Education	Professional Services

Land, Natural Resources, Env. Management	Professional Services
Media	Media
Communications	Communications
Manufacturing	Manufacturing
Arts & Entertainment	Recreation & Tourism
Recreation	Recreation & Tourism
Tourism	Recreation & Tourism
Government/Public Service	Government/Public Service
Building & Construction	Building & Construction
Military & Related Industries	Military & Related Industries
Waste/Recycling Management	Waste/Recycling Management
Housing & Real Estate Services	Housing & Real Estate Services
<b><i>ECONOMIC CHARACTERISTICS</i></b>	
General Commerce	Commerce & Economic Development
Economic Development	Commerce & Economic Development
Economic Geographic Area	Commerce & Economic Development
Employment/Unemployment/Labor	Commerce & Economic Development
Small Business Conditions	Commerce & Economic Development
Corporate Business Conditions	Commerce & Economic Development
Economic & Tax Policy	Economic & Tax Policy
Socio-Economic Conditions	Socio-Economic Conditions
Minority/Cultural Business Conditions	Minority/Cultural Business Conditions
Infrastructure	Commerce & Economic Development