



**County of Humboldt — Community Health Data Dashboard  
Response to Request for Proposals No. DHHS2022-04**  
August 12, 2022

## 1.0 Introductory Letter

Green River is pleased to submit this proposal to help develop and maintain a community health data dashboard for the County of Humboldt. We are a 22-year-old firm actively creating population health and social determinants of health dashboards, and we provide software engineering, biostatistics, public health informatics, and data integration services.

A public health dashboard is most valuable when it successfully informs the public — and supports effective mitigation strategies and prosocial behaviors. A dashboard should provide tools and data visualizations that are clear and informative, and that can be personally relevant and meaningful to a diverse audience. For example, in our public health data reporting work with the State of Delaware ([My Health Community](#)), we developed innovative animated surface models to visualize disease rates across the state. These maps are an easy-to-understand data representation that helps the public understand broader temporal and spatial patterns in disease rates. We also derived and implemented algorithms to ensure data can be represented at the smallest areal unit possible, while maintaining HIPAA-compliant confidentiality. Doing so allows a user to explore specific, small geographies that are meaningful to them, including local neighborhoods, zip codes, block groups, legislative boundaries, and so on.

For the County of Humboldt, we propose to work with you to design, implement, support, and maintain a population health dashboard that initially highlights a few key data sources, and can be expanded in scope over time.

If you have any questions, or if we can provide any additional information, please let me know. Thank you for your consideration.

Sincerely,

Michael Knapp, PhD  
CEO  
[michael@greenriver.com](mailto:michael@greenriver.com)

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### 3.0 Signature Affidavit

#### REQUEST FOR PROPOSALS NO. DHHS2022-04 Community Health Data Dashboard

REQUEST FOR PROPOSALS - NO. DHHS2022-04 SIGNATURE AFFIDAVIT	
<b>NAME OF ORGANIZATION/AGENCY:</b>	Green River Data Analysis, LLC
<b>STREET ADDRESS:</b>	167 Main Street, Suite 103
<b>CITY, STATE, ZIP</b>	Brattleboro, VT 05301
<b>CONTACT PERSON:</b>	Ian Kozak
<b>PHONE #:</b>	802-257-0641
<b>FAX #:</b>	
<b>EMAIL:</b>	info@greenriver.com

Government Code Sections 6250, *et seq.*, the “Public Records Act,” define a public record as any writing containing information relating to the conduct of public business. The Public Records Act provides that public records shall be disclosed upon written request, and that any citizen has a right to inspect any public record, unless the document is exempted from disclosure.

In signing this Proposal, I certify that this firm has not, either directly or indirectly, entered into any agreement or participated in any collusion or otherwise taken any action in restraint of free competition; that no attempt has been made to induce any other person or agency to submit or not to submit a Proposal; that this Proposal has been independently arrived at without collusion with any other Proposer, competitor or potential competitor; that this Proposal has not been knowingly disclosed prior to the opening of Proposals to any other Proposer or competitor; that the above statement is accurate under penalty of perjury.

The undersigned is an authorized representative of the above-named agency and hereby agrees to all the terms, conditions and specifications required by the County in Request for Proposals No. DHHS2021-04 and declares that the attached Proposal and pricing are in conformity therewith.



\_\_\_\_\_  
Signature

\_\_\_\_\_  
Michael Knapp

Name

\_\_\_\_\_  
CEO

Title

\_\_\_\_\_  
August 11, 2022

Date



## 4.0 Professional Profile

Green River is an ISO 27001 certified custom web application engineering, data analytics, and informatics company founded in 2000. We develop "software and analytics for a better world," with a focus on environmental and public health data integration projects.

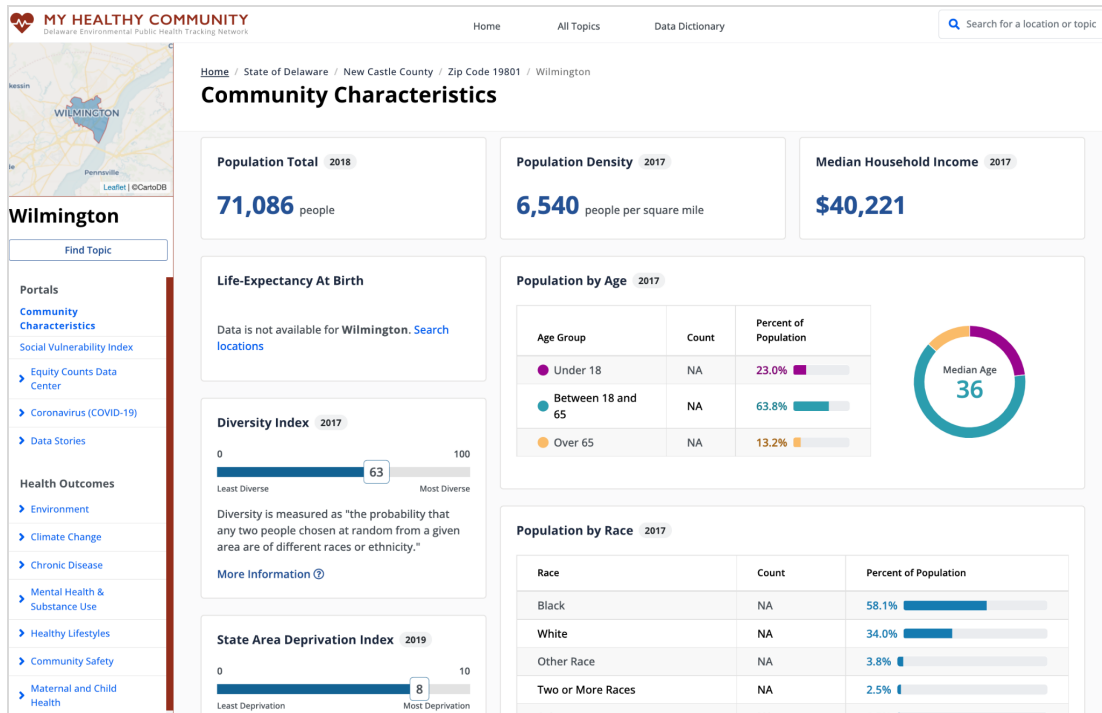
### **Work Example: My Health Community**

Our work includes the design, development, hosting, and support of My Healthy Community (<https://myhealthycommunity.dhss.delaware.gov/>), a comprehensive public health tracking data site for the State of Delaware Department of Public Health (DPH). This initiative covers several population health areas, including social vulnerability, community characteristics, the environment (e.g., public and private drinking water, air quality), chronic diseases, mental health and substance use, healthy lifestyles, maternal and child health, health care utilization, and infectious diseases. It also serves as the state's official COVID-19 dashboard, and we are actively building a comprehensive vaccine dashboard.

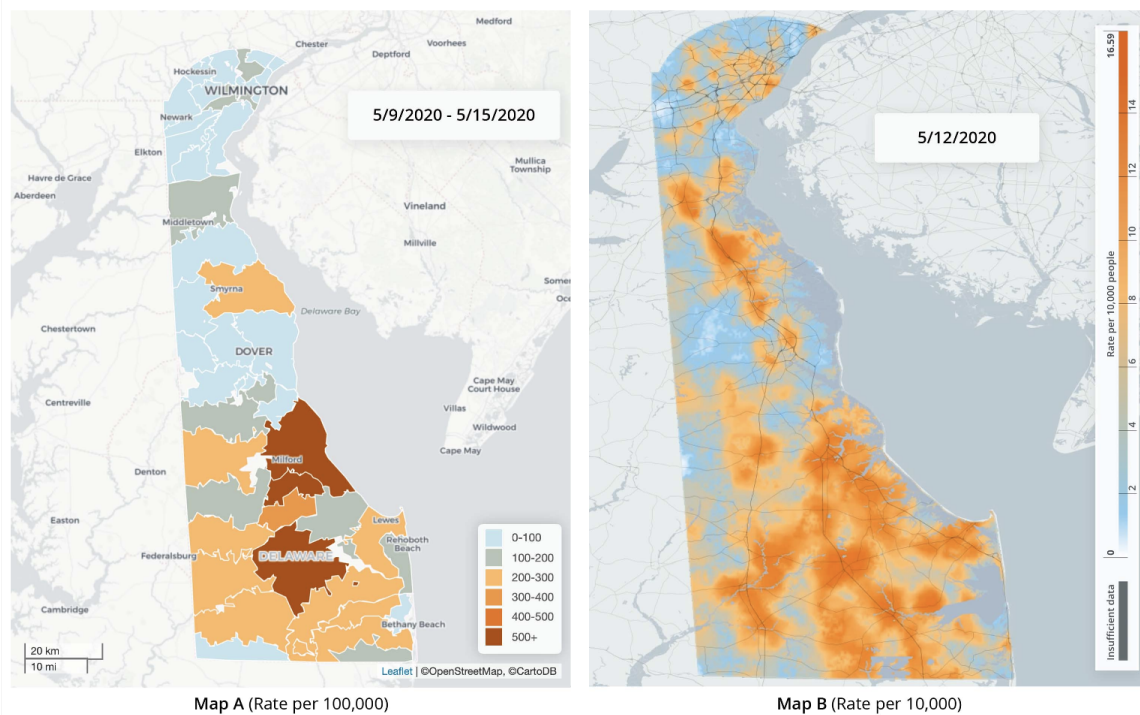
Data should be clear, understandable, and not misleading. Examples of unique innovations we brought to My Healthy Community include the use of animated maps to show geographic and temporal trends of a disease over time. Applied to "heat map" visualizations, we avoid the modifiable areal unit problem (MAUP) that biases choropleth maps. We employ a rate-smoothing process to mitigate the misleading "overrepresentation" of large, low-density regions in geospatial presentations. And, we developed models for showing data at the smallest resolutions possible, while protecting HIPAA-compliant confidentiality. Potentially, that means displaying information at a local neighborhood or block group size.

The aggregation techniques and algorithms we employed to ensure the public data meets an acceptable threshold of individual identification disclosure risk have been certified as HIPAA-compliant by a third-party; technical details of our approach are available at <https://gr-website-production.s3.amazonaws.com/Green+River+white+paper+-+Protecting+privacy+in+the+neighborhood-level+release+of+health+information+-+Knapp+et+al+-+2022-05.pdf>





Screenshot: community characteristics in Delaware (My Healthy Community)



Screenshot: maps of new COVID cases in Delaware (My Health Community)



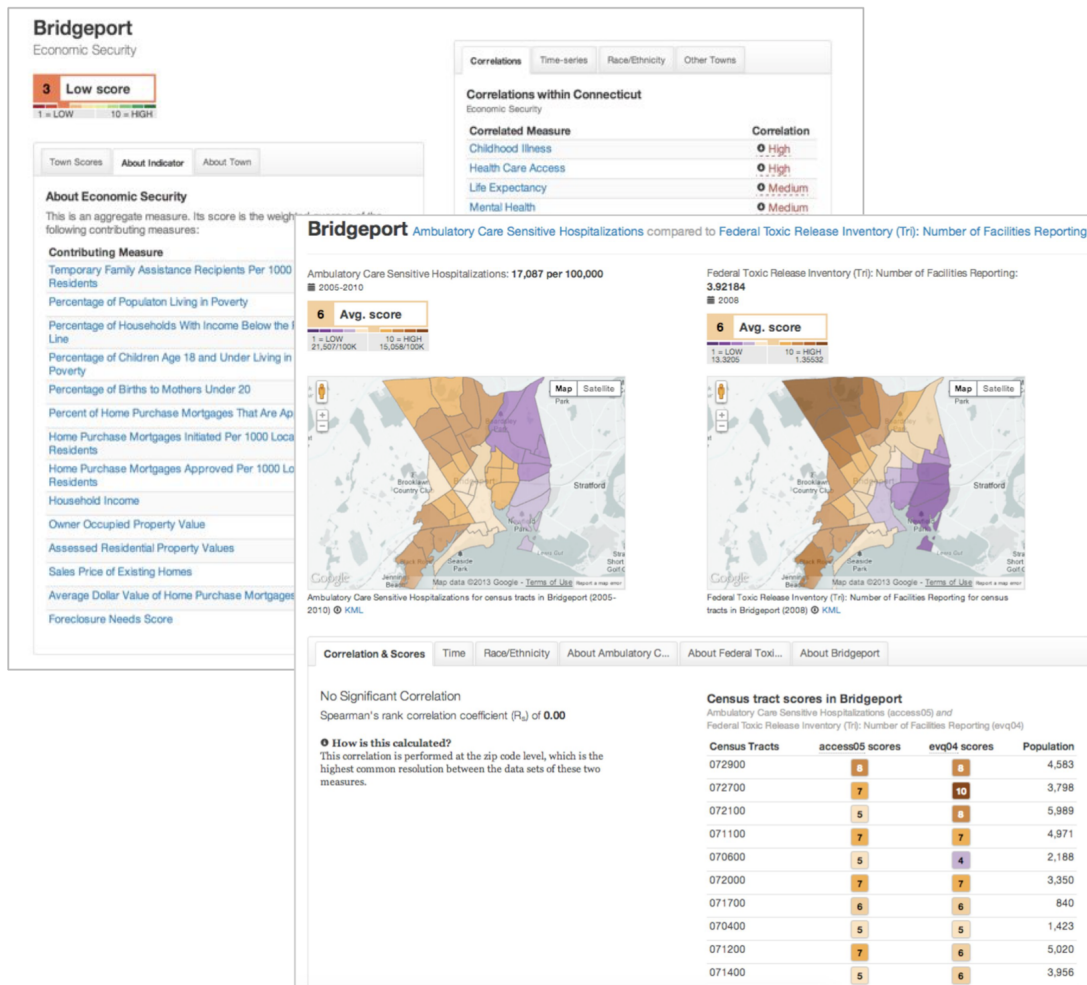
Ultimately, the goal of a public health site is to effect positive outcomes in the population. A dashboard should allow someone to identify and understand the environmental, social, and health factors that are immediately applicable to them and their community. Having access to this data can then empower individuals and community organizations, for example, to plan and execute mitigation strategies.

We recently collaborated with the United Way of Delaware, the Delaware Racial Justice Collaborative, and DPH to create the Equity Counts Data Center (available at <https://myhealthycommunity.dhss.delaware.gov/portals/ecdc>). The Equity Counts Data Center presents data related to racial equity and social justice across health, education, criminal justice, wealth creation, housing, and other areas associated with the social determinants of health. We are also developing a Community Profiles Report that will be used as a guide for community members and community organizations to receive and understand information that is critically, locally relevant.

**Work Example: Health Equity Index**

Green River worked with The Connecticut Association of Directors of Health to create a Health Equity Index, demonstrating the association between public health and social conditions at the neighborhood level. Like My Healthy Community, the tool required us to integrate numerous disparate health, social, and demographic datasets and develop a set of reporting tools to visualize these data.



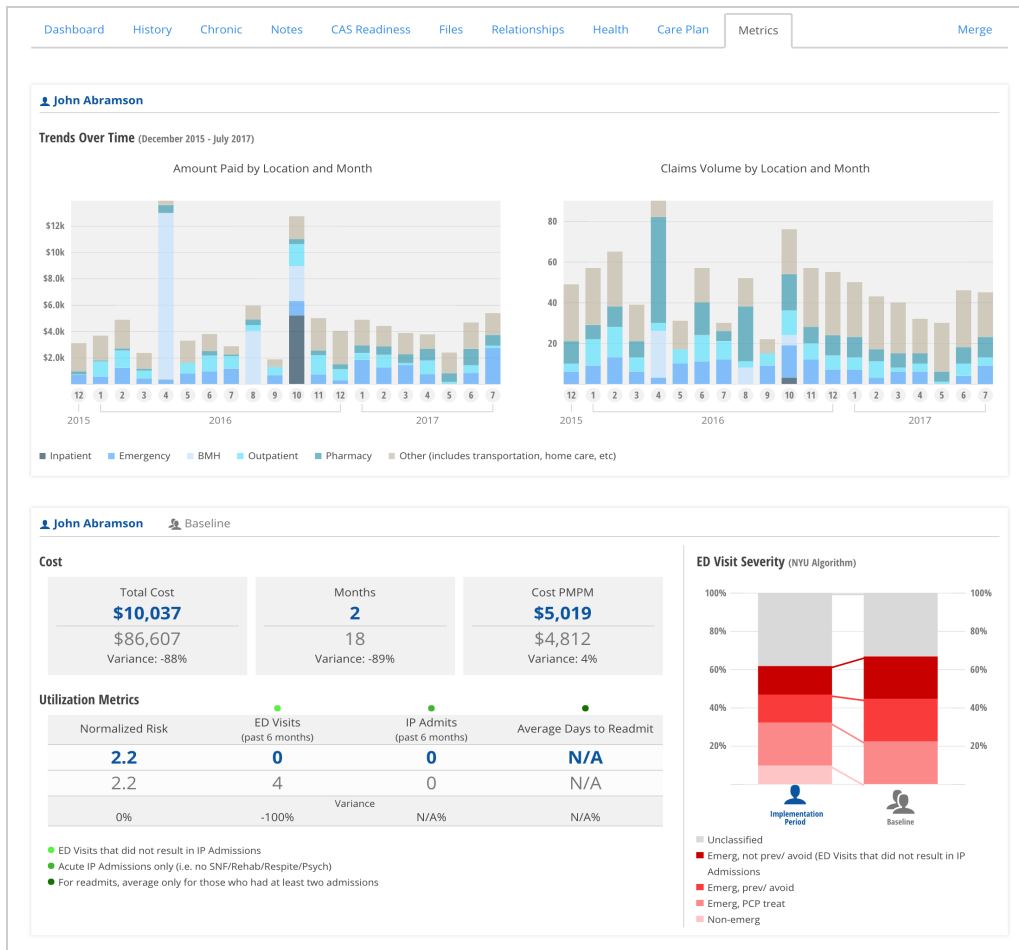


Screenshots: town-level data analysis in Connecticut (Health Equity Index)

### Work Example: Open Path

Since 2015, Green River has developed and supported Open Path, an expansive open source data integration platform for homeless services and related social and medical service providers. Now used by municipalities, county government, state agencies, and nonprofits nationwide (who procure Open Path as 'Software as a Service' provided by Green River), the platform brings together records for reporting, analysis, and individual care coordination. In Boston, for example, Open Path is used to integrate homeless management information system (HMIS) records, electronic health records (EHR), emergency department service alerts, and Medicaid claim history to understand the community population and to deliver person-centered treatment.





Screenshot: Medicaid claims analysis (Open Path)

## Green River

Today, Green River is a 35 person, \$5 million/year company, focused on delivering value and impact. We are a privately held company, without outside investment, and believe our work should focus on touching lives in meaningful, measurable ways — not generate an accumulation of wealth. Open source licensing can create a true shared technology resource, where investment and innovation can help others — and where the client, in turn, benefits. The creation of Open Path, for example, was originally funded by one city; today, over a dozen state and city agencies and nonprofit organizations contribute to its continual improvement.

## Key Project Staff

Green River has dedicated staff responsible for visual design, user interface and user experience design, data science, GIS, web application engineering, and DevOps infrastructure engineering — along with project managers and user





support positions. As an intentionally small company, you will have direct collaboration with key staff, including:

*Michael Knapp, PhD*

CEO and Partner

Before founding Green River, Michael worked as a Biostatistician for Baystate Medical Center (Springfield, MA); an Epidemiologist for the Connecticut Department of Public Health; and as a consultant for the Social and Economic Research program of the World Health Organization (Geneva, Switzerland). Today, in addition to running Green River, he is actively involved in project design and implementation for our public health data projects.

Michael has a Masters Degree in Pollution Science and Management, and a PhD in Environmental Health, from Yale University.

*Grace Charles, PhD*

Data Scientist

Grace heads up our data analysis team, and is responsible for many of the algorithms behind key public health indicators for our work with Delaware. Prior to joining Green River, Grace was Senior Research Scientist for Surgo Ventures, in Washington, D.C., brings facility in experimental design, survey design, causal inference (Bayesian network analysis, potential outcomes framework), behavioral segmentation, message testing, survey weighting, predictive modeling (multivariate regression, hierarchical mixed models), sentiment analysis, power analysis, GIS, and data visualization.

Grace has a PhD in Ecology from the University of California, Davis.

*Lucas Braun, M.Sc.*

Software Engineer

Lucas serves as technical lead on public health reporting projects, as well as being a key member of our GIS team. Before joining Green River, Lucas worked as a software developer for Annkissam, LLC in Boston, MA, and Neusta GmbH in Bremen, Germany.

Lucas has a Masters of Science in Geospatial Technologies from James I University and University of Münster.



## **Disclosure Statement**

Green River has never been involved in litigation regarding any services rendered, has never been accused or convicted of fraud, has never been debarred or suspended from a public contract, and has never been found to be in violation of any applicable local, state, or federal regulatory requirement. Green River has no controlling or financial interest in any other organization; no other organization or external individual has any controlling or financial interest in Green River.

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*802-257-0641*



## 5.0 Project Description

Green River will work with DHHS staff to design the community dashboard, and to identify which data sources and indicators to include. We will develop, host, and provide support for a public, interactive web application. Also in close collaboration with DHHS staff, we will lay out a roadmap and schedule for how and when additional data sources, presentation tools, and indicators will be incorporated into the site over time.

As the needs and priorities of every community are unique, we do not propose supplying a rigid, pre-configured platform or software solution. Rather, we bring experience, expertise, and existing solution patterns to efficiently assemble a system appropriate for Humboldt County. We bring software engineering capacity, along with biostatistics, data science, and data visualization services, which allows us to craft and support a public health informatics platform appropriate to your requirements and resources.

### Design

Compelling, useful, and understandable presentation is critical to the success of a public dashboard. We will look at both the specific data visualization and data exploration tool requirements of the site, as well as the overall user experience — can citizens find and understand what they want?

We will provide UX design services, including a process of discovery and requirements specification, and develop design mockups for review and iteration prior to software development.



*Example design artifacts from previous work: mockup of index display, and high-level site architecture diagram.*



The initial focus will be on a set of interactive and pdf reports built to DHSS specifications, along the lines of the data stories, Equity Counts Data Center, and Community Profile reports we have recently been developing for Delaware Department of Public Health (see, for example, <https://myhealthycommunity.dhss.delaware.gov/stories/vaccination> ).

## Data Sources

We will engineer the dashboard platform to accommodate future expansion, where additional data sets and indicators can be added over time. For the first year of the project, we anticipate focusing on the inclusion of a small number of data sets (which we will collaboratively select with DHHS); we anticipate continuing to expand data sources throughout the duration of the project. We will develop and maintain a data management plan for the project, a detailed data dictionary, data specifications, and metadata descriptions.

The screenshot shows the 'Data Dictionary' page on the My Healthy Community website. The page title is 'Datasets' and it includes a search bar and navigation links. A table lists various datasets with their temporal and spatial resolutions.

Name	Temporal resolution	Spatial resolution
<a href="#">Air Quality Monitoring Network</a>		
<a href="#">Area Deprivation Index (ADI)</a>	2015, 2019	Census block groups
<a href="#">Asthma</a>	Yearly	
<a href="#">Behavioral Risk Factor Surveillance System (BRFSS)</a>	Yearly	
<a href="#">CDC PLACES Small Area Estimates for Health Indicators</a>	2019	Census tracts
<a href="#">Census Shapefiles</a>		Census block groups, census tracts, counties
<a href="#">COVID-19 Cases Among In Person Students</a>	Weekly	Districts and schools
<a href="#">COVID-19 Cases, Contacts, and Deaths</a>	Daily	Census block groups

Screenshot: the data dictionary for My Healthy Community is available at <https://myhealthycommunity.dhss.delaware.gov/data-dictionary/dataset-metadata> — an example of the data sources we frequently work with.



## **Hosting, Training, and Support**

Green River will host, support, and provide training for administrators for the dashboard. We are an ISO 27001 certified organization, and have in-house engineering staff to manage cloud-based hosting infrastructure — including performance and security monitoring — to ensure the dashboard is available and functioning well. We have extensive experience with HIPAA compliance, and staff who have undergone FBI background checks for the handling of confidential medical information.

We will present organized training sessions (realtime, online) for site administrators, and provide email-initiated support for the duration of our engagement.

## **Communications and Project Approach**

Green River will designate a project manager and technical lead for the duration of our engagement, who will be your primary points of contact. You will also collaborate directly with Green River design, analysis, and support staff whenever needed.

We will maintain a shared project plan, and collaborate to set and prioritize specific tasks, deliverables, and timelines for the work. The project is a partnership between our organizations, where success and excellence derive from close cooperation and joint effort — and communication and shared understanding around deliverables and outcomes is critical.

We schedule a regular check-in meeting with you (weekly or biweekly) via video call to go over status, progress, and discuss the issues and decisions at hand. We often have additional periodic "working" meetings as required to review design ideas, features, and perform discovery activities.

We use a project-specific email group, which goes to key team members, for support and general communication, and host video calls ad hoc as needed.

## **Quality Assurance**

Accuracy, reliability, and error free operation are critical to the success of the dashboard — even small glitches or display issues can undermine public trust in the site, and by extension, trust in the data it presents. Our development process involves:



- An engineering code review (by someone other than the author) of all changes and additions.
- Deployment first to a staging environment for both automated testing and internal human review — again, by a team member other than the primary code author.
- "User acceptance testing" (UAT) by you for significant feature changes.

Once code is deployed on the production site, we maintain ongoing, automated performance and error monitoring service.



## 6.0 Cost Proposal

### REQUEST FOR PROPOSALS NO. DHHS2022-04 Community Health Data Dashboard

Itemize all costs that will be incurred by the County for the provision of Services set forth in RFP No. DHHS2021-04. Price Quotes shall include any and all costs associated with the provision of such Services. A narrative should be attached to clarify any pricing data submitted.

<b>A. Personnel Costs</b>	
<p><b>Title:</b> <i>Technical Lead</i>  <b>Salary Calculation:</b> 12 weeks (30 hours/week) effort @ \$185/hour Years 1-2; 3 weeks effort @ \$195/hour Year 3  <b>Duties Description:</b> Oversee technical implementation of the dashboard project</p>	\$84,150
<p><b>Title:</b> <i>Data Scientist/Analyst</i>  <b>Salary Calculation:</b> 6 weeks (30 hours/week) effort @ \$185/hour Years 1-2; 1 week effort @ \$195/hour Year 3  <b>Duties Description:</b> Directs analyses, statistics, and calculations for the dashboard project.</p>	\$39,150
<p><b>Title:</b> <i>UX Designer</i>  <b>Salary Calculation:</b> 1 week (30 hours/week) @ \$175/hour Year 1  <b>Duties Description:</b> Responsible for the visual and user experience design.</p>	\$5,250
<p><b>Title:</b> <i>Software Engineer</i>  <b>Salary Calculation:</b> 4 weeks (30 hours/week) @ \$175/hour Years 1-2; 1 week effort @ \$185/hour Year 3  <b>Duties Description:</b> Provides software development and implementation.</p>	\$26,550
<p><b>Title:</b> <i>Support Specialist</i>  <b>Salary Calculation:</b> 4 weeks (30 hours/week) @ \$160/hour Years 1-2; 1 week effort @ \$170/hour Year 3  <b>Duties Description:</b> Draft and maintain documentation; provide administrator support.</p>	\$24,300
<p><b>Title:</b> <i>Project Manager</i>  <b>Salary Calculation:</b> 4 weeks (30 hours/week) @ \$160/hour Years 1-2; 1 week of effort @ \$170/hour Year 3  <b>Duties Description:</b> Primary point of contact; performing communications, planning, and scheduling tasks.</p>	\$24,300
<b>Total Personnel Costs:</b>	
\$203,700	
<b>B. Operational Costs</b>	
<p><b>Item:</b> <i>Managed Cloud-Based Hosting</i>  <b>Description:</b> Deployment and management of cloud-based hosting infrastructure on Amazon Web Services (AWS) to support the dashboard;</p>	\$105,000



provision and configure applicable services; perform ongoing performance and security monitoring. \$40,000/year Years 1-2; \$25,000 for 6 months operations in Year 3	
<b>Total Operational Costs:</b>	\$105,000
<b>C. Consumables/Supplies</b>	
<b>Item:</b> (none)	
<b>Description:</b>	\$0
<b>Total Consumable/Supplies:</b>	\$0
<b>D. Transportation/Travel</b>	
<b>Item:</b> (none)	
<b>Description:</b>	\$0
<b>Total Transportation/Travel:</b>	\$0
<b>E. Other Costs</b>	
<b>Item:</b> (none)	
<b>Description:</b>	\$0
<b>Total Other Costs:</b>	\$0
<b>F. Indirect Costs</b>	
<b>Item:</b> (none)	
<b>Description:</b>	\$0
<b>Total Other (Indirect) Costs:</b>	\$0
<b>Total:</b>	<b>\$308,700</b>

Years 1 and 2 are calculated at 12 months each; Year 3, per the RFP, is for 6 months service only. The above includes the resources to deliver over a 30 month period:

<b>Requirement/Task</b>
Dashboard platform (search/filter by geography, topic and subpopulation; maps and charts; CSV data downloads; staff upload ability)
Community goals (set, tracking, and display)
Data management (provide and manage list of community health and quality of life indicators; ability to compare and benchmark against other geographies)
Local branding/design
Training and support (meetings, training videos, support materials)
Managed hosting





## 7.0 Supplemental Documentation

None included at this time.

## 8.0 References

### REQUEST FOR PROPOSALS NO. DHHS2022-04 Community Health Data Dashboard

<b>REFERENCE DATA SHEET</b>	
Provide a minimum of two (2) references with name, address, contact person and telephone number whose scope of business or services is similar to those of Humboldt County (preferably in California). Previous business with the Humboldt County does not qualify.	
<b>NAME OF AGENCY:</b>	Department of Health and Social Services, State of Delaware
<b>STREET ADDRESS:</b>	1901 N. Du Pont Highway
<b>CITY, STATE, ZIP:</b>	New Castle, DE 19720
<b>CONTACT PERSON:</b>	Alex Crisco
	<b>EMAIL:</b> alex.crisco@delaware.gov
<b>PHONE #:</b>	
	<b>FAX #:</b>
<b>Department Name:</b>	Epidemiology, Health Data, and Informatics
<b>Approximate County (Agency) Population:</b>	~967,000 (statewide)
<b>General Description of Scope of Work:</b>	<p>Green River designed and developed My Health Community, a health and environmental data tracking network that brings state-wide health data together for the public. Crime reports, childhood lead exposure, diabetes prevalence, Hepatitis C, tobacco use patterns, and many more, all correlated to geography, are presented. The interface protects against the disclosure of personal protected health information (PHI) by internally checking data set sizes for the requested information, and limiting the scope of the results - an algorithm certified by a third-party as HIPAA-compliant.</p> <p>We also created an Opioid Crisis narrative</p>



	dashboard for the state <a href="https://myhealthycommunity.dhss.delaware.gov/stories/opioid-crisis">https://myhealthycommunity.dhss.delaware.gov/stories/opioid-crisis</a> ), and perform the modeling and presentation of state-wide COVID-19 data <a href="https://coronavirus.delaware.gov/">https://coronavirus.delaware.gov/</a> ).	
<b>NAME OF AGENCY:</b>	Stratford Health Department, Town of Stratford, CT	
<b>STREET ADDRESS:</b>	468 Birdseye Street	
<b>CITY, STATE, ZIP:</b>	Stratford, CT 06615	
<b>CONTACT PERSON:</b>	Andrea L. Boissevain, MPH	<b>EMAIL:</b> aboissevain@townofstratford.com
<b>PHONE #:</b>		<b>FAX #:</b>
<b>Department Name:</b>	Health Department	
<b>Approximate County (Agency) Population:</b>	~52,000 (town); ~3.5 million (statewide)	
<b>General Description of Scope of Work:</b>	Green River designed and developed an online catalog of properties associated with an EPA Superfund site located within the town. Andrea was also involved in our state Health Equity Index project with the Connecticut Association of Directors of Health.	

## 9.0 Evidence of Insurability and Business Licensure

Green River understands and agrees to meet the insurance and business licensure requirements specified by the County of Humboldt to perform the proposed work at time of contracting.

## 10. Exceptions, Objects and Requested Changes

None.

