



CENTER FOR ECONOMIC AND BUSINESS RESEARCH



**Washington State Department of
Transportation**

Ridership and Revenue Forecasting





June 15, 2023

Washington State Department of Transportation – Packet A

Submittal email address: CSOSubmittals@wsdot.wa.gov

Dear Review Team,

Western Washington University's Center for Economic and Business Research (CEBR) respectfully submits the following response to your Request for Qualifications (RFQ) regarding Ferry Ridership and Revenue Forecasting

We bring extensive expertise and a proven track record of designing and completing economic impact studies and financial analysis. We frequently work in collaboration with government agencies and local businesses to respond to analysis needs and create high-quality deliverables backed by academic rigor and best practices.

The Center's position within Western Washington University also allows our office to utilize valuable academic and state resources. This includes a network of qualified peers in areas such as Finance, Accounting, and other fields to advise, support, and offer current insight on topics specific to this project's focus as well as share their knowledge of advanced analytic methodologies. At the Center, we provide a variety of insights within our work – not only on the topic at hand but the resources (data) that inform the project.

With our background in regional economic analysis and forecasting, close relationships with other organizations in the Pacific Northwest area, and the wide range of data and personnel resources available to us, we think we are in a unique position to help WSDOT with economic forecasting and other consulting services.

We would greatly appreciate the opportunity to discuss this project in more detail with you.

Sincerely,

James McCafferty
Director
Center for Economic and Business Research

Hart Hodges, Ph.D.
Director
Professor, Dept. of Economics

1. Qualifications/Expertise of Firm

The Center for Economic and Business Research (CEBR) at Western Washington University is a state agency which works in partnership with businesses, non-profits, government/quasi-governmental entities and tribal communities to respond to consulting needs. The College of Business and Economics was established at Western in 1976 and has completed outside consulting work through CEBR since the 1990's.

The Center brings students and faculty together with each client to find solutions that inform, engage and encourage innovation. Our work includes a variety of analysis documents, presentations and facilitated discussions backed by both primary and secondary research. Examples of some of our published work can be found at: <https://cbe.wvu.edu/cebr/past-reports>

Employees also frequently attend seminars, conferences, discussions, and training sessions to stay up to date with the most recent changes in the world of economics and business. The Center is connected to and attends to a number of economic associations/conferences including the Association for University Business and Economic Research, the University Economic Development Association, the National Association for Business Economics, and the Pacific Northwest Regional Economic Conference. Student support staff work in the Center alongside their university coursework and that close relation to modern business curriculum provides distinct advantages. Student work is reviewed by senior staff and subject matter experts to refine key details and produce high quality data and models.

The Center also publishes the Puget Sound Economic Forecaster. The Forecaster contains summary forecasts, in-depth economic exploration and sector specific analyses in monthly updates and quarterly publications. This includes ten-year Puget Sound forecast tables, seven regional indexes, current local economic indications, a housing market index, and other academic research. The Center also works with other businesses and state agencies to build statistical and functional models for data optimization and analysis.

CEBR has a single office in Parks Hall, Western Washington University. Occupying the office are the two co-directors, two senior research staff, and between 6-12 graduate and undergraduate student researchers throughout the year.

The Center has not worked with subconsultants on similar projects but is open to collaboration with potential partners.

Organization Chart:



Key Staff	Hours
James McCafferty	4 hours per month – Project Management
Hart Hodges	5 hours per month – Economic Analysis
Bethany King	12 hours per month – Economic Analysis
Cam Mackenzie	4 hours per month – Project Management
Student Researchers	2+ hours per month – Research/Writing

Related Projects:

1. WSDOT Bonding and Retainage 2022
 - a. \$60,000
 - b. Client seeks assistance with evaluation overall equitability of its projects using multiple lenses. Focus on right of way or condemnation, maintenance and preservation investment, and agency workforce demographics.
2. Strata Energy Storage Economic Impact Analysis 2022 - Ongoing
 - a. \$16,500
 - b. Client seeks assistance with cost-benefit and economic impact analyses of an energy storage project.
3. Department of Children, Youth, and Family Modeling and Consulting Services 2021-Ongoing
 - a. \$250,000
 - b. Client seeks assistance with economic data collection, financial modeling, and analysis to assist with understanding the estimated costs of differing childcare service lines.

Additional examples of the Center’s work and reporting can be found at:

<https://cbe.wvu.edu/cebr/past-reports>

2. Qualifications of Proposed Project Manager

James McCafferty oversees all project management for the Center, from initial scoping to final presentation. Three recent examples of complex project management experience include a significant number of projects from Department of Children, Youth, and Families, The City of Bellingham neighborhood survey, and Outdoor School research for Office of Superintendent of Public Instruction.

James has managed projects for DCYF since 2021, maintaining a strong relationship with our client, high-quality deliverables, and on-time completion of work. James managed all aspects of scoping, timeline, quality assurance, and deliverables. This work covers a number of different financial models, economic forecasts, focus groups and meeting facilitation, as well as secondary data collection.

The City of Bellingham neighborhood survey has been managed by James from 2018, to the most recent run in 2022. James managed scope, distribution, quality assurance, time management, and publication.

James also manages Outdoor Education research for OSPI. Requested by the legislature, the 2021 study included primary and secondary data, a survey instrument, discussion groups, and additional data regarding options, expansions strategies, current practices, and demographic data. This complex project completed cost-benefit analysis regarding outdoor education for 5th and 6th graders in Washington. This initial study has led to on-going work with OSPI and industry partners.

James is a Certified Global Business Professional and as Director of a Research Center within a State Agency, has a thorough understanding of regulatory requirements that may apply to this project. Past work regarding requests from the Legislature, private sector analysis, and academic research all have extensive and varying regulations and a significant list of our work which meets regulatory burdens can be found at <https://cbe.wvu.edu/cebr/past-reports>.

James is a proven project manager, with a capacious history of projects completed to very high levels of quality, on timeline, and on budget. By generating a scope of work or project flowchart with the client, the project schedule can be managed, progress checked, and changed if need be. The flexibility of the research center allows us to pull on additional researchers as needed to complete tasks, while maintaining a core set of engaged employees. The Center focuses on iteration and collaboration in our work and welcome feedback and questions. This continuous improvement model helps maintain schedule, avoid scope creep, and anticipate and respond to changes that will inevitably arise. Our academic background also assists with scope creep, as our researchers know when to identify when projects should be extended, split apart, or otherwise adjusted. Budget issues are resolved using the Center's all inclusive hourly rates per employee division.

As Director for the Center of Economic and Business Research, he serves as the general project manager. He brings a unique perspective and critical tools to problems faced by organizations today based on professional and community service experience at local, regional, and national levels. James has an MBA from Western Washington University, a Bachelor of Science in Journalism/Public Relations from the University of Oregon and is a Certified Global Business Professional. James is also a past board member at the Association of University Business and Economic Research (AUBER), giving the Center access to a peer-review system for our work to ensure its accuracy, validity, and legitimacy.

3. Key Team Members Qualifications (Prime Consultant and Sub-Consultants)

Hart Hodges, PhD

Dr. Hodges is an Associate Professor of Economics at Western Washington University, where he also serves as the director of the University's Center for Economic and Business Research. In

addition to his work at the University, Hart is a registered investment advisor and vice president at Waycross Investment Management Company.

Hart is a past president of the Association of University Business and Economic Research and a member of the National Association of Business Economists. Hart volunteers his time on several boards and through the Center helps a variety of non-profit organizations. He received his Ph.D. in economics from the University of Washington, his Master's in Environmental Management from Duke University, and his BA from Williams College.

Hart would be in charge of econometric analysis and overview of model materials. Hart would help manage workload and timeline among himself, Bethany, and other economics researchers. Hart has worked on a number of economic impact analyses as well as the Alaska Marine Highways System.

Bethany King

Bethany serves as the Research Economist at the Center. She oversees the economic modeling for the Puget Sound Economic Forecaster and assists with the construction of economic impact models. Bethany serves as a mentor, coach and process manager for the Center's graduate and undergraduate students. Bethany has an MS in Economics from the University of Wyoming and a BS in Economics and Environmental Systems Science also from the University of Wyoming.

Bethany would be the main effort behind econometric analysis and modeling, with the most engagement with the ferry ridership forecast and data. She has completed numerous econometric models and forecasts within the last 3 years for Strata Energy, HomeStreet Bank, Sound Transit, and others.

Cam MacKenzie

Cam serves as the Research Designer at the Center. He oversees the development of analysis instruments and models as well as qualitative data analysis. Cam also serves as a mentor and project manager for the Center's graduate and undergraduate students. Cam has an MBA and a BA in International Business/Economics both from Western Washington University.

CEBR Center Staff

A collection of undergraduate and graduate students will focus on developing forecasts, analysis, and report narratives under the supervision of the Directors. Our student staff members are selected from the very best minds at Western from across multiple disciplines and deliver work consistent with most graduate students at our neighboring Universities. Students present their work at conferences to faculty around the United States and are held in high regard within the academic community. Students are generally available as part-time staff, who may be added to the project as needed for task completion.

The staff will be responsible for the direct labor involved in research, analysis, and any writing required for deliverables. Research analysts are responsible for meeting internal deadlines, maintaining clear communication with James, Hart, Cam, and Bethany in accessing resources

necessary to ensure that they are providing the most accurate and polished analyses, reports, and deliverables for the project.

4. Firm's Project Management System

Quality assurance processes play a crucial role in ensuring the delivery of high-quality services to clients. These processes involve a systematic approach to assessing and monitoring the various aspects of consulting engagements to maintain the highest standards of excellence. Quality assurance starts with a comprehensive analysis of client requirements, followed by the development of a tailored consulting strategy. Through meticulous planning and risk assessment, potential obstacles and challenges can generally be anticipated and mitigated in advance. During the execution phase, regular progress checks and milestones are established to ensure adherence to project timelines and objectives. The Center generally meets with clients weekly-monthly to ensure progress. Rigorous documentation and thorough data analysis are performed to validate the accuracy and effectiveness of the consulting recommendations or provided data. Furthermore, client feedback is utilized to continuously improve the consulting processes and deliverables.

We prefer to use an all-inclusive rate based on the scope of the project (i.e., the client pays for the work done, not the hours spent doing the work). We believe that this method creates better incentives in the relationship between consultant and client. For example, the client can ask questions and ask for revisions without worry of going over budget. The Center's management staff is responsible for keeping track of deliverables within the scope, ensuring that the project remains on track for each component in the scope of work. Initial scope timeline creation and regular iterative contact with the client has proven very successful in managing project scope and budget.

We do not use formal project management software, instead relying on a visual project management system and weekly management team meetings which reviews all on-going projects. The visual system ensures all research team members all have the latest information and allows for more efficient resource allocation. Project timelines are formed after initial conversations (often in a flowchart format) and are often subject to change as iteration is completed.

Every other week, the entire Center staff meet to discuss projects and provide updates. This allows all Center staff to be aware of all ongoing projects which allows us the ability to substitute researchers into different projects as needed. Management staff checks in with the project team via email or Microsoft Teams on a regular (often daily) basis. The internal project team for an individual project will have regular meetings to check in, verify data and information, and maintain timelines. Center staff set their own modality with most working hybrid, though some work nearly fully remote and others work nearly fully in-office. The hybrid nature of collaboration in the Center creates significant flexibility for both worker-worker and worker-client communication.

We prefer to have a collaborative and iterative relationship with clients and/or stakeholders. We have found that building a strong relationship and communicating regularly with clients leads to the highest quality project outcomes as they have had the most engagement and review among stakeholder groups. For most clients, we schedule regular check-in meetings to update the client on the project's progress and work through any problems. Most communication is done via email, and we typically ask for client feedback at various project milestones.

5. Project Delivery Approach

Initially, we would want to spend time learning from you what has worked well in the past and what has been lacking or not as robust as desired. We would also want to conduct a literature review to help inform decisions about model structure and perhaps talk with others who have worked on similar questions – such as forecasters at B.C. Ferries and consultants who have worked with the Alaska Marine Highways System. (Some of our team members have worked with AMHS on ridership studies in previous positions.)

Economic forecasts can be constructed based on different modeling approaches. For example, it's possible to imagine a forecast for ferry ridership based on the factors that have the most influence on ridership – such as fares, frequency of service, various amenities, etc. This would be a structural approach. However, it's also possible to imagine a forecast for ridership based primarily on past ridership. The latter time-series approach contains the implicit assumption that the influence of different service levels, amenities, etc. are embedded in the past data.

It is also possible to combine the two approaches by constructing a forecasting model that has a mix of key deterministic variables and past observations of actual ridership. We would propose working with such a model, noting that data availability and the accuracy of forecasts for deterministic variables would be crucial in deciding exactly which variables to include. We also note that the specific structure of the model could vary by route.

Different modeling approaches can be appropriate depending on exactly how the model output will be used or what questions need to be answered. If the emphasis is on how changes in service modifications might affect ridership and revenue, a structural model that has variables for different service factors might be preferred. However, data limitations and the need to run different scenarios to ask “what if” (such as what might happen with small changes to tariff structures) could point to a simpler model that leverages past ridership to build the forecast. We hesitate to recommend or to propose a specific modeling approach here. Instead, we are trying to explain briefly different modeling approaches and would look forward to working with WSDOT to determine the best modeling approach for the specific needs to be addressed.

We know that the past several years have created a range of challenges. Ridership changed significantly with safety concerns, business closures, and changes in who needed to work in the office or at home. These changes could be modeled in different ways. As such, we imagine needing to explore different modeling approaches and to test those approaches by forecasting the very recent past. (We can imagine trying to model the Covid related changes as outliers or,

alternatively, structural changes in commuting and leisure travel. We do not know right now which conceptualization would generate the best forecasts.) In addition, we know that service has been disrupted due to labor shortages. Shortages in the recent past have to be considered carefully in any forecasting model AND the model(s) to be used have to allow for different staffing scenarios going forward. We envision working with you to develop those scenarios, knowing that the process could be iterative (that is, agreeing on possible scenarios, running the models, and then perhaps revising the scenarios) or result in a matrix of possible forecasts depending on the input assumptions.

It is important to note that forecasts rarely predict the future exactly right. That is, there will be some amount of forecast error. Models need to be tested repeatedly and possibly revised based on what the tests and new data reveal. As such, we would expect to build models and use the models to forecast ridership and revenues under different scenarios. Over time, we would want to study the accuracy of the forecasts and possibly revise the models slightly to improve their accuracy. A considerable amount of learning occurs during the construction of the models when everyone discusses exactly what should be highlighted in the models and why, as well as the pros and cons of different data. Views about what should be highlighted and what data sources are the most reliable can change over time with model testing. So, we underscore here the need for good, ongoing dialogue with you.

We prefer to work collaboratively with the client to ensure that the development of the work plan meets the client's needs and meets industry best practice. The Center's management staff are primarily responsible for the decision-making process to develop a work plan. The work plan is then shared with the client for input and feedback before being finalized. Sometimes, as we work on a project, new needs emerge, and we are able to respond flexibly to the client's changing needs or to unexpected complications. Our collaborative and iterative approach is designed to be adaptable to change, as well as resolve issues regarding communication or confusion among stakeholders.

Forecasting requires dealing with countless contingencies and we are no stranger to uncertainty. There are several methods for dealing with these uncertainties. One option is to choose the most likely result and assume that the most likely outcome will be the outcome. Another option is calculating an expected outcome based on the values of each possible outcome and the probabilities of each. Finally, we can offer scenario-based forecasts that provide predictions given several possible outcomes. There is no one single correct option and each contingency will require a unique strategy.