

How Missouri’s Legislators Got Their “Science Notes”

After years of development, an innovative science and technology policy fellowship program now provides nonpartisan information to the legislature of a state with thriving science, technology, and biotech industries.

Missouri has a large science and technology industry, including companies such as Cerner (now a part of Oracle), Emerson Electric, and Bayer’s North American headquarters for crop science. It also hosts a burgeoning biotechnology industry that employed more than 31,000 workers as of 2020. The state is home to two respected research universities—Washington University in St. Louis and the University of Missouri-Columbia—as well as the Donald Danforth Plant Science Center and the Stowers Institute for Medical Research. Yet, despite the importance of science and technology in Missouri’s economy, until recently few of the state’s technical experts were regularly engaged in policy conversations at the state level.

In 2016, one of us, Rachel, along with Hallie Thompson and Mike Hendricks, who were all then PhD students at the University of Missouri (fondly known as Mizzou), began talking about creating a state-level science and technology policy program to help bring the work of the research and development community to inform policy decisions at the state capitol in Jefferson City. At the time, there were no formal science policy efforts or science and technology

policy fellowship programs in the Midwest. We felt that Missouri could create a model for surrounding states.

Out of these early conversations, the Missouri Science & Technology (MOST) Policy Initiative was born. MOST is dedicated to connecting science and policy at the state and local levels, promoting the long-term health, sustainability, and economic growth of Missouri communities. The long path to building MOST has been driven by our conviction that we needed to develop a genuine, nonpartisan program that embraces Missouri’s strengths and responds to the state’s needs.

MOST was conceived with Missouri’s unique circumstances in mind. The Missouri General Assembly, currently controlled by a Republican supermajority, is composed of 197 senators and representatives who serve no more than eight years in each chamber. Each year, lawmakers come to the capitol from January to May, and then return to their home districts and day jobs for the remaining seven months of the year. Staffing at the legislature is far below what a federal lawmaker might have and even less than that of many other state legislatures, at an average of 2.2 partisan and nonpartisan staff members

per legislator. These staffers remain at the capitol year-round but are usually too busy with constituent queries and other responsibilities to conduct extensive policy research.

During the legislative sessions of 2018 and 2019, we—Rachel, Hallie, and Mike—made weekly trips to the state capitol to learn what types of expertise lawmakers wanted and to generate support for a fellowship program. With the help of undergraduate leaders of the Associated Students of the University of Missouri, we first met lawmakers who represented the districts that include the four University of Missouri system universities and who supported our goals.

Next, Rachel started on the top floor of the Senate, while Mike began on the first floor of the House, and we went door-to-door gathering lawmakers' signatures on a letter of support used for outreach with other lawmakers and funders. We also met with the directors and legislative liaisons of almost every state agency.

requested by lawmakers and made publicly available. When testifying, fellows could testify for informational purposes only, rather than in support of or opposition to pending legislation. Putting all of this together, we decided to provide information to lawmakers in a format called "Science Notes" that would complement the fiscal notes already included with each piece of legislation.

In 2020, MOST received a Courtesy Resolution from the speaker of the House, Representative Elijah Haahr, recognizing it as an organization dedicated to providing nonpartisan science and technology policy information to the General Assembly. In September 2020, MOST launched its initial cohort of five policy fellows—a number we determined would be able to cover most of the science and technology topics in the more than 2,000 bills the Missouri General Assembly considers each year. One of us, Brittany, was part of that first cohort. The program was housed at the University of Missouri Graduate School and was supported by

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The project found several early champions, including Senator David Sater, a pharmacist. When we encountered pushback, which we did from both sides of the aisle, we took note of what the concerns and objections were and used them to help determine what the fellowship program would look like.

Our plans were further shaped by a 2019 survey of state legislators, who said they primarily relied on their colleagues, lobbyists, and cursory web searches to gather evidence when creating policies, programs, and practices. Concerns about partisanship also informed the design of the initiative. We envisioned a program that would provide reliable information to any lawmaker, regardless of political party, expertise, or network. Rather than placing fellows directly into legislators' or committee offices, we set up the program so that fellows report directly to a supervisor at MOST. Lawmakers we spoke with said they felt this structure would improve the credibility of the fellows and help the program maintain a nonpartisan reputation.

Another consideration that shaped the program was guidance from the Missouri Ethics Commission, which said that to avoid being categorized as lobbyists, all information the program provides to lawmakers must be

family foundations, including the James S. McDonnell Foundation, the Gordon and Betty Moore Foundation, and the Chan Zuckerberg Initiative.

Finding the best means of communication

Science Notes are the primary way that MOST communicates policy research information to legislators and communities. These are short, easy-to-read surveys of existing research information related to a policy problem or proposed solution. Science Notes are always nonpartisan and never make policy recommendations. Instead, they emphasize potential trade-offs, so that readers can understand what is known (and unknown) about how policies intersect with their goals and values and become familiar with arguments both for and against a given policy. All Science Notes are published on the MOST website and are freely available to everyone.

Because MOST's role is strictly nonadvocacy, all Science Notes must be requested by a state representative or senator. When a request is made, we often follow up to understand exactly what the requester wants to know. Science Notes are written and edited in an iterative process that is carefully documented, so that we can update them with new information as it becomes

available. Fellows and staff rigorously review each Science Note, keeping an eye out for lopsided discussion of trade-offs and emotionally charged or value-laden language.

In the last two years, we've published 194 Science Notes, responding to requests from 85 legislators, or about 45% of the Missouri General Assembly. The subjects include health care access (for example, rising costs, medical licensing, and maternal and infant mortality) and similarly granular treatments of issues regarding educational access, renewable energy, broadband, elections, and agriculture. Some notes have responded to contentious topics. For example, the legislature has considered bills on the "right to repair" farm equipment as well as concentrated animal feeding operations (CAFOs) for feedlots with more than 1,000 animals.

We regularly survey legislators to get their feedback about whether the Science Notes are meeting their needs. Through this process, we've learned that the notes are used in various ways, but most often to prepare testimony for committees and to support conversations with other lawmakers. As a result of this feedback and the short turnaround times (24 to 48 hours) for lawmakers to read and review Science Notes during a legislative session, we recently unveiled "Science Notes 2.0," which shortened the length of the notes and made it easier to find key ideas in a visually appealing format.

Working with skeptical decisionmakers

A common theme in our conversations with lawmakers has been the necessity of building trust and demonstrating MOST's value by being consistent in action and intent. Lawmakers are not inclined to trust a new organization claiming to be unbiased, so rather than simply asking them to trust us, we know that we must earn that trust by consistently following a set of guiding principles.

MOST'S ENGAGEMENT WITH MISSOURI LEGISLATORS

	2020-21	2020-22
New Science Notes	88	105
Science Note Updates	-	36
New Requestors	47	37
Repeat Requestors	14	36
In-Person Testimony	8	19

Our principles are structured on the "honest broker" framework described by Roger A. Pielke Jr. in *The Honest Broker: Making Sense of Science in Policy and Politics* (2007). This approach emphasizes applying academic expertise to sharing and interpreting research information without making a policy recommendation. We have used this framework to develop a set of conditions that we must meet.

First, we are transparent about limitations. Often, information about a policy problem is unknown or incomplete. Although scientists may resist discussing the limitations of their work, lawmakers on both sides of the aisle have consistently told us they distrust anyone who claims to "have all the answers." We are therefore forthcoming when information is limited or research lacks consensus.

Second, we make our sources easy to find. One of the easiest ways for readers to evaluate trustworthiness is to check where information comes from. In every Science Note, sources are clearly cited and linked, so that readers can evaluate how much weight they want to put on a particular dataset or trade-off.

Third, we intentionally recognize and address our own biases. Training for fellows includes exercises dedicated to identifying the biases each person brings to their work—reflecting their experiences, culture, and values. The intention of this training is not to eliminate all bias within an individual, but to make sure that the bias does not affect our program's research and interpretation. Another explicit way to find and reduce bias is our peer review process, which is an important procedure that ensures what we publish is as fair, objective, and complete as possible. Before publishing, three people review each Science Note to ensure that it is unbiased and easy to understand and that it provides a clear overview of the requested topic.

Fourth, to be truly honest brokers requires an intentional strategy to prevent "shadow advocacy." Science Notes should never contain policy recommendations that can be read "between the lines." One way to avoid this is to emphasize trade-offs, so that readers can identify how the research coincides with their values and other concerns. For example, CAFOs have negative impacts (producing lots of animal waste, for instance), but they are also a cost-effective way to house animals used for food. We are transparent about these trade-offs, so that policymakers can make their own decisions.

Finally, we focus on being genuine partners who are committed to building long-term, trusted relationships to fulfill our mission. Rather than leading with our expertise and expecting to be trusted because of the

letters following our names, MOST staff and fellows emphasize active listening to understand the interests and goals of Missourians across the state. By asking questions and de-centering ourselves from the issues at hand, we can actively respond to Missourians' needs and position ourselves as partners instead of advocates. We also maintain a consistent presence in the capitol, making sure that lawmakers know that we are available for additional research. Ultimately, we know that we can be most effective at sharing scientific information when we are seen to provide reliable support year after year.

Looking forward

In the past two years, we have demonstrated that our approach to evidence-based policymaking can increase the ways that research is included in policy conversations. By combining rigorous nonpartisanship with research expertise and relationship-building, MOST hopes to become a repository of institutional knowledge with the ability to improve state government efficiency and effectiveness.

While there is a clear demand for this work, sustaining programs like ours—and creating similar programs in other states—will require an influx of financial and logistical support. MOST fellows are funded by private family foundations, which support one or two fellows for one to two years. This model provides substantial financial resources, but it also makes planning for the longer term difficult. Although some foundations have the capacity to renew grants over several years, others prefer to fund a single project rather than provide ongoing support. As a result, it can be difficult to predict what our capacity will be more than two years out from any given point. This limit on long-term planning is disruptive: our capacity to respond to research requests varies year to year based on available funds instead of on demand for our services, which is a hurdle to the stability our program needs to build credibility.

Another obstacle is that some traditional funders are eager to see immediate results from their investments: votes changed, types of bills introduced. But, as our experience illustrates, the desire for short-term measurable wins fails to account for the critical and necessary time that must be spent first to build trusted relationships. It also misses impacts that are harder to measure, such as seeing science informing more conversations and evidence forming the basis of more bills. Other funders may prefer to support activist organizations over rigorously nonpartisan programs like ours; but in our experience, to be most successful,

programs must be tailored to the needs of their states, not philanthropic funders.

One potential source of funding for state-based programs is states themselves. The California Council on Science and Technology Fellowship, for example, recently received a \$10 million endowment from the California state government to support its continued service to the state. However, lack of such secure funding may ultimately hamper the ability to build research capacity in the areas that may need it most—like Missouri.

In the absence of sustained state support, science and technology policy fellowship programs need an institutional network dedicated to long-term support. State philanthropic foundations and donors might set up endowments to ensure consistent funding over time. The National Science Foundation or other prominent federal

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institutions might find ways to support programs at the state level, while leveraging broader knowledge networks to bring more expertise to the underserved areas.

In the long term, successfully building more programs like ours requires reliable funding sources as well as community buy-in about the value of evidence-based policymaking—even if short-term impacts may be hard to see. To provide state policymakers with information they want and need to make the best decisions for their constituents, everyone—large national partners, local funders and supporters, and states themselves—needs to step up.

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