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## Special Issue Introduction: Writing Infrastructure

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# Introduction: Writing Infrastructure

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## ABSTRACT

This article is the introduction to the second of two Communication and Design Quarterly special issues focused on conceptualizations of infrastructure. While there are more continuities than differences between the themes and methodologies of articles in the first and second issues, this second issue leans towards articles that have taken up infrastructure as it pertains to writing and rhetoric. This introduction frames the value of infrastructure as a metaphor for making visible how writing and rhetoric structure and enact much of our world, especially for writing pedagogy. In addition, this article concludes by introducing the six contributions in this issue.

## CCS Concepts

Information Systems

## Keywords

Infrastructure, writing studies, technical communication

“Standing in the chilly, roaring machine room that houses the supercomputer among rows and rows of black metal cases that enclose 786,432 processors capable of processing 10 quadrillion calculations per second, nothing could be more certain than the supercomputer’s substantial materiality.

What is less immediately comprehensible is how the supercomputer was built, or “stood up” in the parlance of high-performance computing, since none of the rhetorical, political, technical, or manual labor required to build the machine leaves an explicit trace on the supercomputer.” (Read 2020, p. 7, emphasis added)

And this is the problem with most of the writing that builds the world...it leaves no trace. When we look around as we move through our daily routines of work, personal, and public life, we don’t see the massively complex assemblages of genres of documents reaching across time, often years, authored by countless, usually unnamed, people, processes, and technologies. Certainly, the supercomputer tells no tales about its origins in acts of Congress or electricity contracts, and neither do the farmed oysters in Ryan Weber’s article in this issue explain their debt to the Alabama Administrative Code. The good news, however, is that mute supercomputers and oysters make work for the writing researcher to document and, more importantly, shed light on how writing, understood comprehensively in this issue as product, process, and suasive and epistemic rhetoric, functions as infrastructure for, to put it in the grandest possible terms, civilization as we know it.

This special *CDQ* issue on infrastructure is the second of two and thus this is the second editor’s introduction. As a new and apparently emerging genre, the second editor’s introduction is free to set its own conventions, primarily a pledge to not repeat the first one (too much) and to explain the special emphasis of the contributions collected in this issue. If you are reading this introduction as a summary of infrastructure and fields related to writing, rhetoric, and communication, we recommend that you go back and read the introduction to the first issue as well.

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We've been thinking about writing as infrastructure for a long while now. Sarah, the lead editor of this issue, began with an interest in writing and had a coffee shop epiphany during graduate school that connected her childhood fascination with Richard Scarry's detailed illustrations about how houses are built and mail is delivered in *Busytown* (1968) with her emerging interest in how writing gets the world's business done, mostly without fanfare or much notice. Jordan, however, came from an infrastructural background and his epiphany went the other way. Whereas Sarah developed her ideas about infrastructure through her initial interest in writing, Jordan came to the idea of infrastructural writing through his initial interest in infrastructure. His second and third book focus on material infrastructure, and while researching them he realized that beneath all that material lay layer after layer of a different type of infrastructure: documents...countless documents of standards of policies of meeting minutes. In other words, Sarah got to infrastructure through writing theory and Jordan got to writing theory through infrastructure. These two paths into infrastructural theory acknowledge the duality at its heart: that material infrastructure and discursive infrastructure are co-constitutive, or to put it more simply, one doesn't exist without the other.

One of the most memorable Scarry illustrations is of a house under construction with the framing and plumbing and other essential infrastructure that makes a house function made visible as the worker animals put them in. Plumbing, electrical and HVAC systems are of course the infrastructure that enable our comfort while indoors, just like writing course syllabi structure a learning environment that meets regularly and is, or should be, organized, fair, and productive. By equating a course syllabus with bathroom pipes, we are construing writing as equivalent material infrastructure to the building systems hidden in the walls. While limited in some ways, we argue this powerful metaphorical relationship between writing and building systems and material objects is broadly accessible to people within or outside of our scholarly community. Given the accessibility of the concept, writing as material infrastructure is a powerful place to start talking about how writing enables and structures social environments and processes, and organizations, especially in a classroom setting.

Yet, as developed in the introduction to the first special issue on infrastructure, we know that metaphorically construing writing as infrastructure at the level of materiality only gets us to the doorstep of what "infrastructure" as a metaphor for understanding the function of writing can offer. The concept of infrastructure has been taken up in studies of information systems and knowledge work to construe more than a material "substrate" that "sinks into an invisible background" (Star & Griesemer, 1989, p. 112) upon which something else operates. The term infrastructure has been taken up in technical communication and writing studies (DeVoss et. al., 2005; Read & Swarts, 2015; Swarts, 2010) as a relational concept that foregrounds how infrastructure dynamically shapes social practices and organizational structures. As developed in the introduction to the first special issue, this relational notion of infrastructure is inherited from the work of Susan Leigh Star (1999) and her colleagues (Star & Ruhleder, 1996), especially Geoffrey Bowker (Star & Bowker, 1999). Many of the articles in this special issue also carry through this relational notion of infrastructure.

## INFRASTRUCTURE AND WRITING STUDIES

The relatively undeveloped notion of infrastructure construed metaphorically as both material and relational has been circulating in writing studies and technical communication for at least 15 years. However, because infrastructure has emerged simultaneously in the work of scholars from different areas of the field, the object of infrastructure has varied depending on the study and sometimes within the study. For example, Vee (2013) applied the term to the practices associated with literacy, which she understood as the successful use of technology-mediated communication practices (e.g., symbolic writing systems or, more contemporarily, digital technologies) in order to navigate daily life. Hart-Davidson et al. (2007) applied the material and social notions of infrastructure to writing practices in an organization. Another useful notion of infrastructure in Writing Studies scholarship is that of writing programs as infrastructure (Grabill, 2010). For Grabill, infrastructure "does work" (p. 15, see also Grabill, 2007; Read, 2015), which means that an assemblage of people, things, technology, and documents cannot be considered infrastructural until what it is infrastructural to can be identified—the assemblage must do something for someone. Within this understanding of infrastructure as emergent, what counts as infrastructure is determined based on its real-time outcomes rather than on the existence of a static collection of objects that have conventionally been identified as infrastructure. In other words, a bridge to nowhere does not count as infrastructure.

As we detailed in the introduction to the previous issue, these two special issues of CDQ dedicated to the topic of infrastructure were born of what Sarah and Jordan saw as an exigence to consolidate and centralize scholarship informed by notions of infrastructure in a way that it has not previously been. For the first time, these special issues bring together scholarship specifically organized around "infrastructure" to assert it as a durable, capacious, and productive lens for scholarship in writing studies, technical communication, and communication and media studies. Our inspiration for editing these issues was based on work each of us has done on infrastructural writing (Frith, 2019, 2020; Read, 2015, 2019, 2020), which has theorized infrastructure under the banner of our own fields. One of our major hopes is that our fields take up infrastructural concepts and make them our own rather than to continue to borrow and appropriate theory from others. Until our collaboration on these special issues, we worked in parallel to theorize the material, social, technological, and relational functions of writing, communication, information, standards and other essentially discursive objects and practices.

While there are more continuities than differences between the themes and methodologies of articles in the first and second issues, this second issue leans towards articles that have taken up infrastructure as it pertains to writing and rhetoric. Each of the articles in this special issue continues the work of refining and expanding the territory for understanding the function of writing as infrastructural. For the sake of fulfilling our jobs as guest editors, we have categorized the six pieces in this second issue into three groups of two: Publishing and Scholarly Infrastructure, Qualitative Infrastructural Inversions, and Rhetorical Theory and Infrastructure. Information architecture, after all, is an essential infrastructure for usability and cognitive processing. Categories, while useful for motivating critical discussion, can also be overly deterministic, so

it is important to acknowledge that more than any article belonging fully to an assigned group, the articles are all writing infrastructure.

## **PUBLISHING AND SCHOLARLY INFRASTRUCTURE**

Scholarship and the broader business of academia is, by nature, largely writing based. Thus, in writing and rhetorical studies, disciplinary rhetorics (e.g., the rhetoric of science) and scholarly writing and editorial practices have long been rich objects of study. Two contributions to this issue extend the focus on academic discourse by revealing infrastructures that both dramatically shape and limit: citation practices and academic publishing conventions and platforms. In writing studies and allied fields, scholarship enacts the disciplinary community that it also studies.

In their article, “Citational Practices as a Site of Resistance and Radical Pedagogy,” Cana Uluak Itchuaqiyag and Jordan Frith skillfully argue that academic citational practices work as a mostly invisible discursive infrastructure, which they understand as both the material citation infrastructure in academic writing and scholarly databases as well as the cognitive and social practices that motivate scholars’ citation choices. They argue our fields are currently facing a “moment of breakdown” that is revealing how citational practices have perpetuated the historic and systemic suppression of women’s and BIPOC scholars’ voices. In response to this breakdown, Itchuaqiyag and Frith present a case study of an infrastructural intervention that aims to reframe citational practices as sites of resistance and pedagogy: The multiply marginalized and underrepresented (MMU) scholar database. The MMU is a list of scholars who self-identify as MMU and also a bibliography of scholarship. The MMU database functions to restructure citation practices by brokering alliances among scholars and embedding inclusion in our discipline. Importantly, the creators of the MMU database have structured it so that users must actively engage with the material citation infrastructure (e.g., scholarly databases and search tools) to search for and access scholarship, which ensures algorithmically that this scholarship will become more visible and surfaced over time.

The second contribution, “The Text-Privileging Infrastructures of Academic Journals,” is, as an infographic, which by design is a bit unusual for an issue of academic scholarship. This very fact that it would be described as unusual, however, speaks directly to Carrie Gilbert’s astute observation that technical and cultural academic publishing infrastructures, such as publishing guidelines and platforms, including the ACM Digital Library that hosts this issue, and editorial review processes, privilege textual forms of knowledge over visual ones. Despite recent increased attention to the importance of visual literacy and multimodality, publishing infrastructure continues to treat visually-based knowledge as secondary, and subservient to, text-based scholarship. This bias towards text misses opportunities to make complex concepts accessible to a wider audience and limiting the types of knowledge that can be accepted within the realm of scholarship.

## **QUALITATIVE INFRASTRUCTURAL INVERSIONS**

While the methodology of infrastructural inversion underwrites many of the articles in this issue, the third and fourth articles in this issue perform qualitatively informed infrastructural inversions (Star & Bowker, 1999) to build new theory. As a methodology,

an infrastructural inversion makes the invisible visible via a researched reverse engineering that reveals the multiple stakeholders, technological decisions and standards, and embedded organizational processes that shape the experiences and situations of daily life. Qualitative research, normally in the form of interviews of stakeholders and the collection of documents and other artifacts from the field, adds the insider or the expert perspective to the study of the infrastructure in question. This real-world data, often including photos and direct quotes of stakeholders, lends a verisimilitude to the accounts that elevates the facts of the specific infrastructure to the same level as the generalizable contribution to theory. In other words, both of these articles could be read to learn specifically about the experiences of redeeming nutritional benefits or oyster farming in the gulf coast, regardless of an investment in the theory of writing studies.

Dana Comi’s article, “It Must Be a System Thing,” reveals how the often-fraught check-out experiences of users of Special Supplemental Nutrition for Women, Infants, and Children (WIC) benefits are shaped by an invisible and remote state-level information infrastructure called the Approved Product List (APL). For users, the standardization of benefits enforced by the centralized APL determines which food items they can and cannot purchase with benefits. When the local store signage, point of sale database and staff knowledge of the system are not aligned with the content of the APL, users of WIC benefits can experience embarrassment, stress, and conflict with other shoppers as their grocery items are scrutinized and routinely deemed unacceptable for purchase. In this case the APL functions as a remote site of information infrastructure that perpetuates systemic inequity by limiting the redemption of benefits and by requiring that already-stressed recipients exert additional emotional and physical energy to develop hacks and workarounds. While Comi’s infrastructural inversion importantly shifts the argument about why WIC benefits are difficult to redeem away from user error to the broader flawed infrastructural information infrastructure, she importantly leaves us wondering what other genres of information infrastructure invisibly perpetuate inequality.

While not explicitly a project of infrastructural inversion, Ryan Weber’s “Making infrastructure into nature” reveals the ecology of genres that has enabled Alabama’s oyster aquaculture to thrive, despite the dramatic fall in natural oyster populations in the Gulf of Mexico. In particular, Ryan develops the notion of performative infrastructural documents, which function, with the support of a broader document ecology, to authorize and enable the construction of physical infrastructure, such as that required to farm oysters. Ryan usefully differentiates the performative function of ALA. ADMIN. CODE r. 220-4-.17 – Shellfish Aquaculture Easements from the infrastructural functions of other documents integral to the process of developing the Code, such as documents that support research reporting and advocacy. Performative infrastructural documents enact the realities that they describe because of their power to mandate or legislate the building of or changes to material realities, such as the infrastructure for farming oysters. In other words, it’s not wrong to say that the writing in ALA. ADMIN. CODE r. 220-4-.17 quite literally created living creatures.

## **RHETORICAL THEORY AND INFRASTRUCTURE**

While qualitative studies of how texts perform infrastructural functions have a fairly deep history outside of writing studies, for

example Michel Callon's 1995 field study of how "writing devices" (Callon, 2002, p. 192) function as management tools for a cruise company on the Seine, the explicit explications of an infrastructural rhetoric are unique to this issue. Certainly, there are antecedents to the notion of an infrastructural rhetoric, such as the extensive writing studies scholarship founded upon the metaphors of ecologies (e.g., Edbauer, 2005; Spinuzzi, 2004) and networks (e.g., Read, 2016; Spinuzzi, 2008) that have documented how writing, often construed as genres, functions to constitute social actions. However, the articles in this issue explicitly synthesize the theory of infrastructure with rhetorical theory and create a foundation for a new theory and practice of infrastructural rhetorical analysis.

In the fifth article, Jonathan Adams details how his encounter with infrastructures as "malleable rhetorical texts" that "increase our persuasive capabilities" began with the choice between installing cable or satellite internet service in his apartment in the context of teaching remote courses in 2020. While remote from the time and place of decision making, future rhetorical situations would be shaped by this decision, such as an undelivered remote course lecture on a day with cloud cover, should he choose the satellite option. Infrastructures, he argues in his article, "A Theory of Infrastructural Rhetoric," are rhetorical objects because they shape rhetorical situations, although usually not visibly before they are intentionally identified via the enhanced rhetorical analysis proposed by his theory. For example, the long-ago decision of where to locate a billboard shapes its rhetorical situation today as much as its message or design. Rhetorical decision-making is, therefore, diachronic because past decisions shape today's rhetorical situation as well as those in the future. To help us organize how to identify and catalog infrastructures as rhetorical objects, Adams proposes a taxonomy, called Infrastructural Mapping, of physical, economic, social, operational and authority infrastructures. These additional elements add holistic and diachronic perspectives to the traditional rhetorical situation of audience, speaker, and message. It's main value, Adams argues, is to save time in the event of a failed rhetorical situation, since the source of the failure (e.g., a wrong choice of internet provider) will be more available and, hopefully, within the realm of control of the rhetor (what Adams codifies as malleability).

Finally, this issue closes with what is simultaneously a fairly traditional rhetorical analysis via the lens of situational analysis of three historical U.S. public policy texts related to our national infrastructure and also an insightful infrastructural inversion that draws direct lines of causality between the infrastructure-related topics of these key texts and how people and the environments they inhabit are construed. In their article "Using Situational Analysis to Reimagine Infrastructure," Mary LeRouge, Clancy Ratliff, and Donnie Johnson Sackey show us how three policy documents about infrastructure, in all its shifting meanings, have direct consequences for the lived realities of citizens, especially citizens who have been historically unnamed in official texts, such as the vulnerable, BIPOC communities or others at the margins of society. These consequences are the result of how the texts frame humans and their relationship to their environment, both built and natural. Humans, the authors argue, are always central to infrastructure, even when the texts might seem to be about roads, bridges, and the internet. In any discussion about infrastructure, in this special issue and beyond, this is the paramount point to guide our thinking and actions.

## CONCLUSION AND LOOKING FORWARD

A longer-term aim of these special issues is to work towards establishing "infrastructure" as an equally familiar metaphor for writing as "communication." It is already a public and academic commonplace, and deeply theorized, that writing, broadly understood, functions to "communicate." We would be hard pressed to find someone anywhere who would disagree with the statement, "Learning to write is important because good communication is essential to professional success." However, it is a newer idea, and definitely not yet a commonplace, that writing can also function as "infrastructure."

We might be harder pressed to find someone outside of writing research who would understand the statement, "Learning to write is important because documents function as essential organizational and social infrastructures." As compelling, but also potentially abstruse, as the second statement is, there is a risk that the powerful notion of writing as infrastructure could be limited to the realm of scholars and scholarship, and so far, it largely has been. This would be a shame, because as the articles in this special issue demonstrate, an infrastructural lens for writing has the power to reveal mechanisms of power and exclusion that have a direct impact on some of the most vulnerable people in society. As those of us who teach writing know, the infrastructural lens already informs our writing pedagogy, whether explicitly or implicitly. Our hope as editors of these special issues is that these articles can become tools in writing classrooms that establish the infrastructural functions of writing as equal to the more conventional communicative ones already supported by standard technical and professional writing textbooks.

## NOTES

This article was accepted before Jordan Frith became editor-in-chief of *Communication Design Quarterly*

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Sarah Read is Associate Professor and Director of Professional and Technical Writing in the English Department at Portland State University. Her publications include single-authored and collaborative articles in *Technical Communication Quarterly*, *Journal of Business and Technical Communication*, *Written Communication*, *College Composition and Communication*, *Programmatic Perspectives* and the *Journal of Writing Research*, as well as the conference proceedings of SIGDOC (Design of Communication (ACM)) and Pro Comm (IEEE). In addition, she has published four book chapters in edited collections and recently co-edited (2022) a double special issue of *Communication Design Quarterly* on the topic of Infrastructure. She currently serves as Vice-Chair of SIGDOC.

Jordan Frith is the Pearce Professor of Professional Communication at Clemson University. His primary research focuses on mobile media and communication infrastructure. He is the author of 5 books and more than 40 journal articles in a variety of disciplines, including communication studies, technical communication, media studies, and geography. He has also published in public venues like Salon, Slate, and The Conversation and edited multiple journal special issues. He is now the editor of the X-Series on Parlor Press and the editor-in-chief of the ACM publication *Communication Design Quarterly*.