THE MAINTAINERS
coloring book

MAINTENANCE / MAINTAINERS / ECOSYSTEMS / RESEARCH

Dedication

We dedicate this coloring book to all of the people whose daily efforts keep the world going.

About this book

Text and illustrations in this coloring book are inspired by papers and presentations that were part of The Maintainers III: Policy, Practice, and Care conference program in 2019. The text and overall design of this coloring book were created by Jessica Meyerson. The illustrations of this coloring book were created by Bernardo Robles Hidalgo, with design and layout by Kelly Pendergrast. Feedback and edits to this coloring book were contributed by Liliana Coelho, Lauren Dapena Fraiz and Andrew Russell.

Not unlike many facets of life, this project required re-orientation since Covid-19 began to alter the world in 2020. The concepts of maintenance explored through these pages reflect a unique moment, prior to that reality. Many aspects of our collective relationship to maintenance have changed, while others have become more apparent. Throughout this coloring book we wish to bring reflective questions, guiding you to identify your connection to maintenance and how it changes over time.

Each illustration has a number and a title, which appears at the top of the page. The numbers are assigned by MAMA. MAMA is an architecture practice that collects references and produces illustrations as a research methodology into the subject of maintenance.

Recommended citation
The Maintainers. Meyerson, J. and B. Robles Hidalgo (2022). The Maintainers Coloring Book.

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Cover image
00135, by MAMA Brussels

"I don't get why people don't like to clean. Is there any better way to get to know a house?"
— M.T., architect and housewife.

How to use this coloring book

While the coloring book is divided into four sections, the images are not intended to be colored in any particular order. You can color the last page first, or open the book to any of the sections and start coloring.

If you printed this coloring book out on standard printer paper, we recommend that you use crayons, colored pencils, lead pencils and other lightweight tools to avoid bleeding on to the opposite side of the page. We discourage using markers, watercolor, oil paint, acrylic paint, and other materials that require a heavier surface to hold the ink and/or color unless you printed or transferred the images in this book onto much heavier material.

Once you have colored all of the images in the book, consider using the pages for an alternative purpose:

- Decorate a room, or decoupage an object

- Take pictures of your favorite colored pages and share them online using #colorfulmaintenance. Tag @The_Maintainers on Twitter, and @TheMaintainersNetwork on Instagram!

- Write your own image captions — create stories around the maintenance, repair, and infrastructure featured in each image

- Share the book with a friend and talk about the themes and the images. Ask one another:

  - Do you have connections to the maintenance, repair and infrastructure work featured in the images?

  - What do you maintain? What does that maintenance work look like?

  - Why do you care about the things you choose to maintain?

  - What would the world look like if everyone was excited about maintenance?

- Recycle or compost the book depending on the materials you used!

Learning objectives

Our hope is for those who engage with this book to come away with a new understanding of maintenance. The four sections of this coloring book have additional questions for you to consider while you make your art. These questions have been modified from the NYS Common Core Arts Standards, and are geared toward students at the high school level and beyond. Younger learners may have questions for adults, and thus we encourage parents and teachers to review the coloring book prior. (http://www.nysed.gov/curriculum-instruction/arts-standards-implementation-resources)

Contributors

Liliana Coelho thinks about social change within the day-to-day, slow systems, small scale. Her curiosities have supported her work on projects with abortion companions, research on aging and guaranteed income, and in place-based projects with rural teachers.

Lauren Dapena Fraiz's background is in research, education, and non-profit development. She's particularly interested in the intersection of maintenance with social care, feminist praxis, and in the development of a research agenda that meaningfully bridges disciplines together.

Bernardo Robles Hidalgo is the co-founder of MAMA, he was trained as an architect and project manager for construction. He develops his architectural practice around social housing, alternative living spaces as well as common spaces. Promoting maintenance as a central element within these projects.

Jessica Meyerson is a facilitator and applied researcher with a background in political and information sciences and is interested in the ways that organizational design and information systems design reflect who and what we value. She partners with groups and organizations that are navigating change towards a more equitable information landscape.

Kelly Pendergrast is a writer and researcher who works on issues of digital policy, environmental justice, and the political economy of technology. With colleague and co-founder Anna Pendergrast she runs Antistatic, a small research and communications consultancy.

Andrew L. Russell is an historian who writes about technology and maintenance in diverse realms such as telephone and computer networks, the skilled trades, education, and upkeep around the house.

Table of contents

00071: Window Washer (attached to the facade with a harness) of Norman Rockwell for The Saturday Evening Post published September 17, 1960

MAINTENANCE
Maintenance is deeply connected to matters of power, governance, and representation.

Key questions: What role does persistence play in maintenance? Who is maintenance done by? How is maintenance organized? How do you maintain materials, tools, and equipment for everyday life?

00117: The annual "dinosaurs" cleaning at Crystal Palace
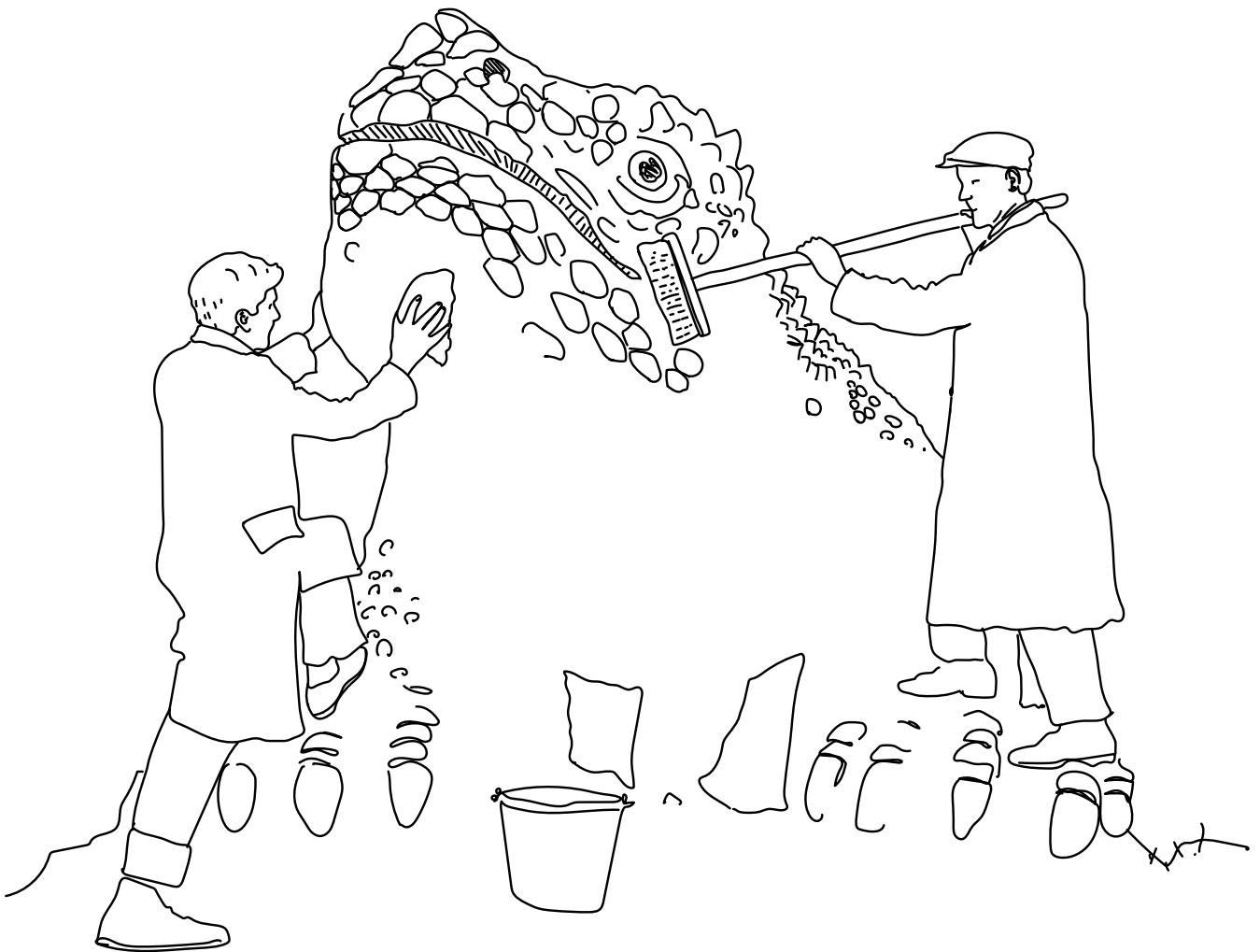
The Crystal Palace was a cast iron and plate glass structure, originally built in Hyde Park, London, to house the Great Exhibition of 1851. A series of dinosaur sculptures were unveiled at the Crystal Palace in 1842, representing the latest scientific knowledge at the time. This illustration is based on a 1930 photograph of one of the dinosaurs getting its annual spring cleaning.

00143: Maintaining the stories of the Deaf communities at Gallaudet
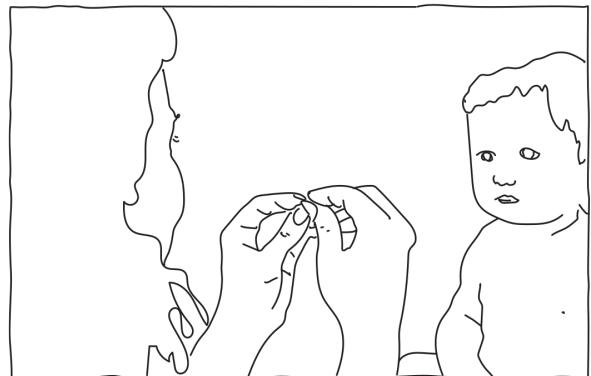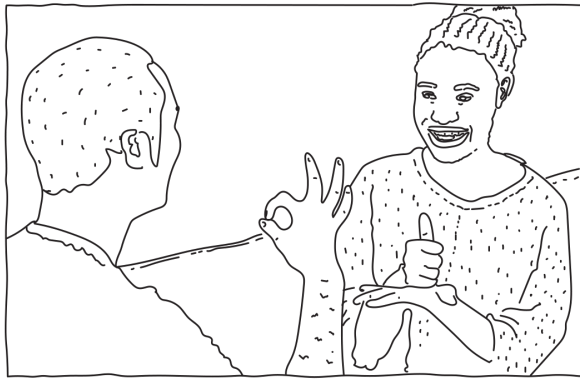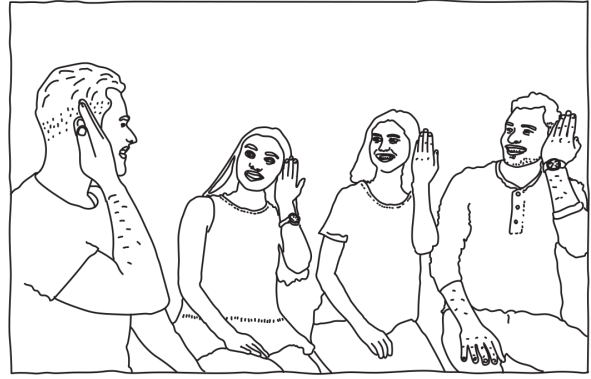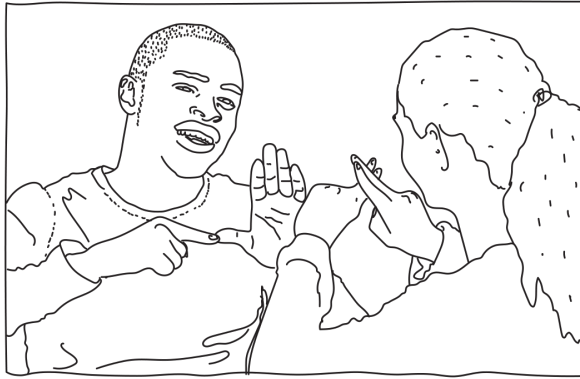
One form of power is your ability to tell your own story, to talk about your own experience in your own words – and to have control over how that story is recorded and retold over time. The image depicts video image stills of groups and individuals communicating in American Sign Language. These videos have been collected as part of the Gallaudet Video Archive. As a collection, the archive must be maintained so that it can be used as a resource by current and future users that are interested in learning about the deaf communities documented in the archive.

00142: A Valuable Flaw: Bug Bounty Programs, Software Maintenance, and Infrastructure Labor
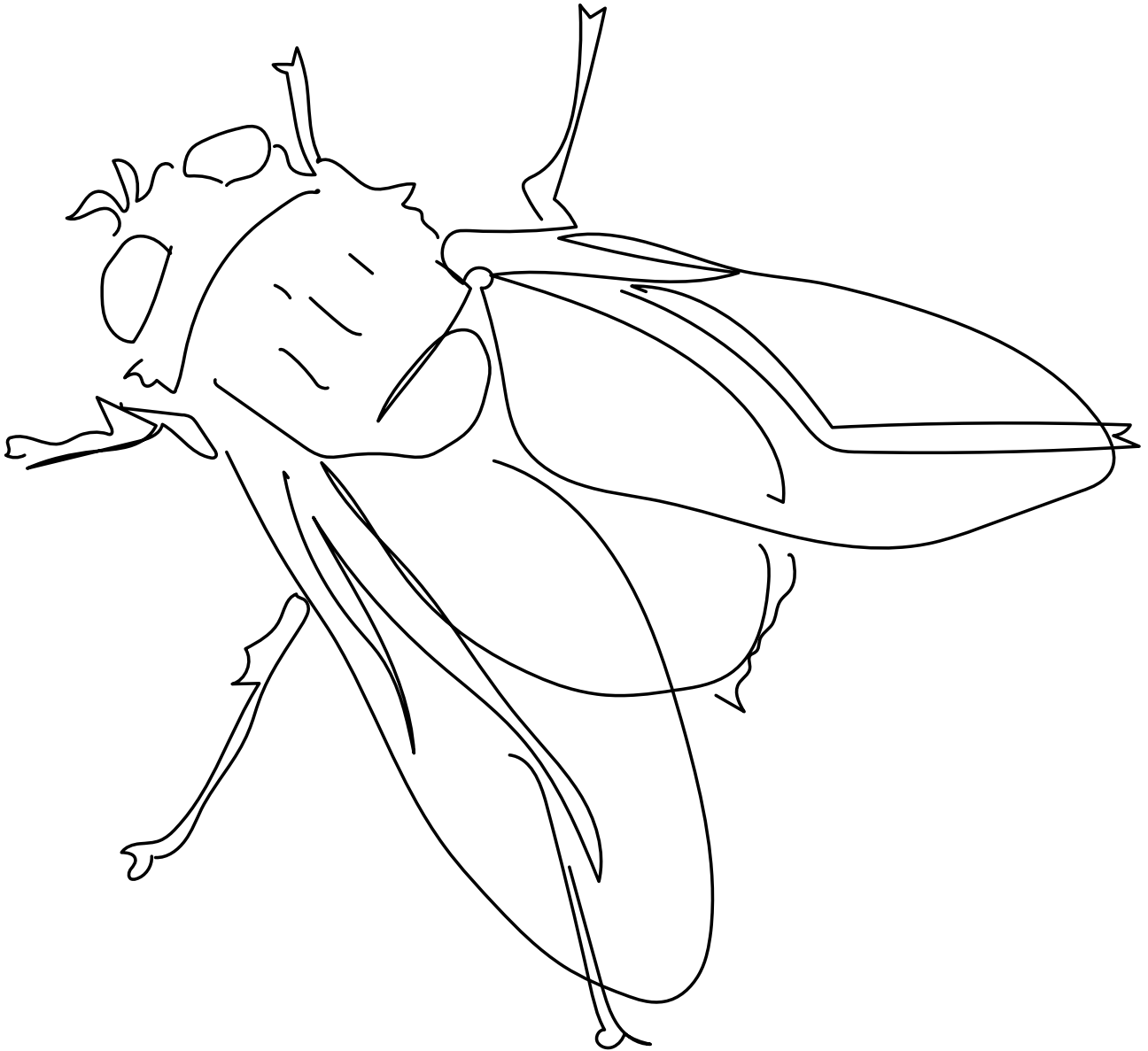
A fly is a specific kind of bug. A software bug is a problem in a computer program that causes the software to break. Software companies pay individual software developers and maintainers money, a "bounty", if they can find bugs in other developers' code. This system allows software development companies to find and address major product bugs at very low cost as well as recruit new developers to their team based on demonstrated skill. For the developers that are competing for the bounty, the system allows them to raise their status and influence among fellow developers.

00141: Done, if by Sea: Consequences of the Potential End to the Alaska Marine Highway System
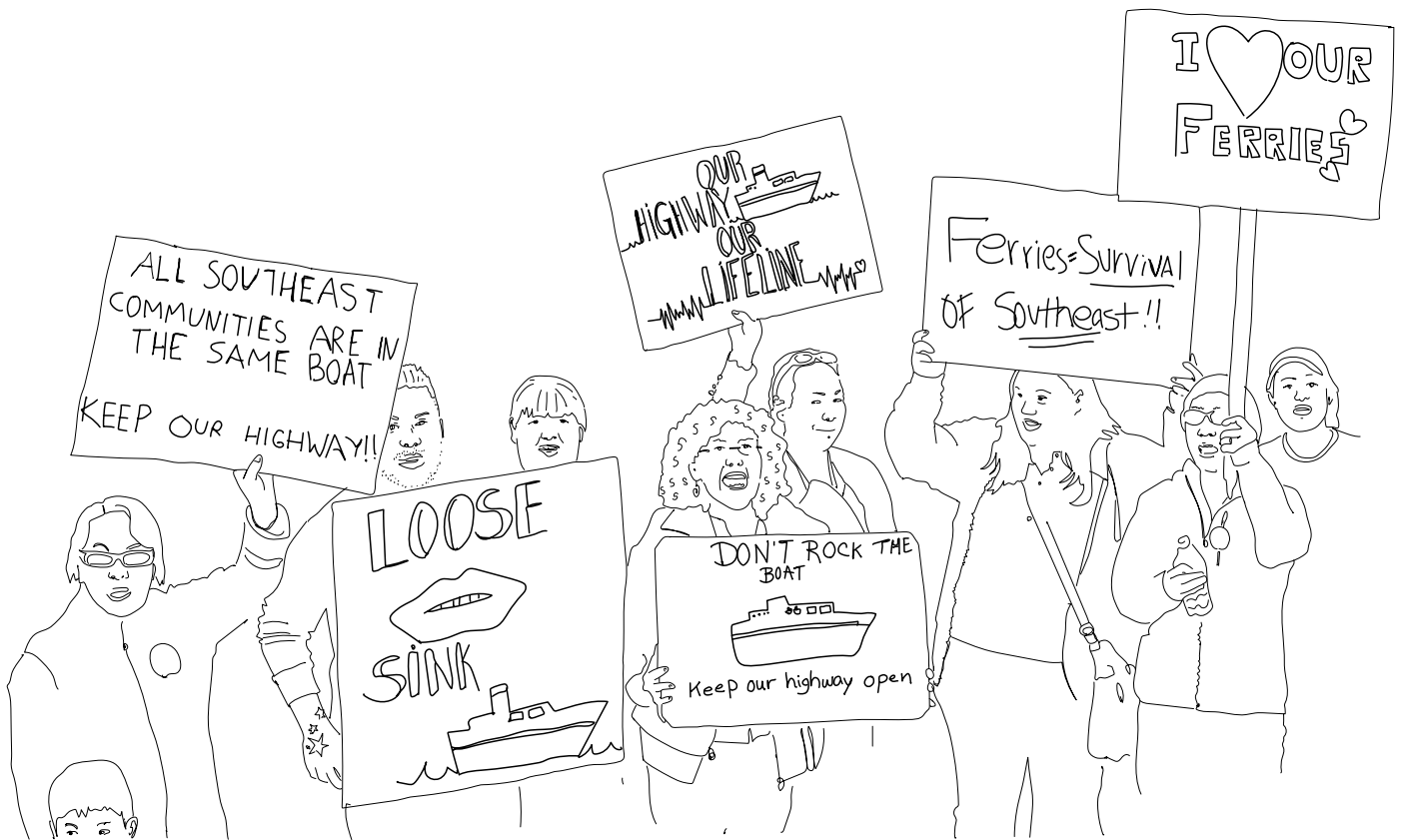
Governance is about who gets to make decisions and how those decisions are made. Our decisions can have a big impact on other people's lives, especially when people trust us to make decisions on their behalf. Here, we see people protesting the end of the Alaska Marine Highway in front of elected government officials. For many, maintenance of the Alaska Marine Highway is central to their livelihood. For elected officials, the decision to end the highway factors in costs, environmental impact, and popularity among the broader population of Alaskan voters that decide who is elected or reelected to represent the state.

There are too many important things to know in the world for any one person to know everything. Instead, we "specialize," learning a lot about specific things - like the law. We trust these specialists to use their knowledge for good. Legal experts include public defenders, who may examine the social and legal needs of their clients in order to limit the consequences of criminal charges. In-house counsel might provide legal advice when developing a project to sidestep legal issues, rather than waiting for a lawsuit to drop. Maintenance is the everyday work of lawyers, whether they represent organizations or individuals.

00038: The Housing Act of 1949
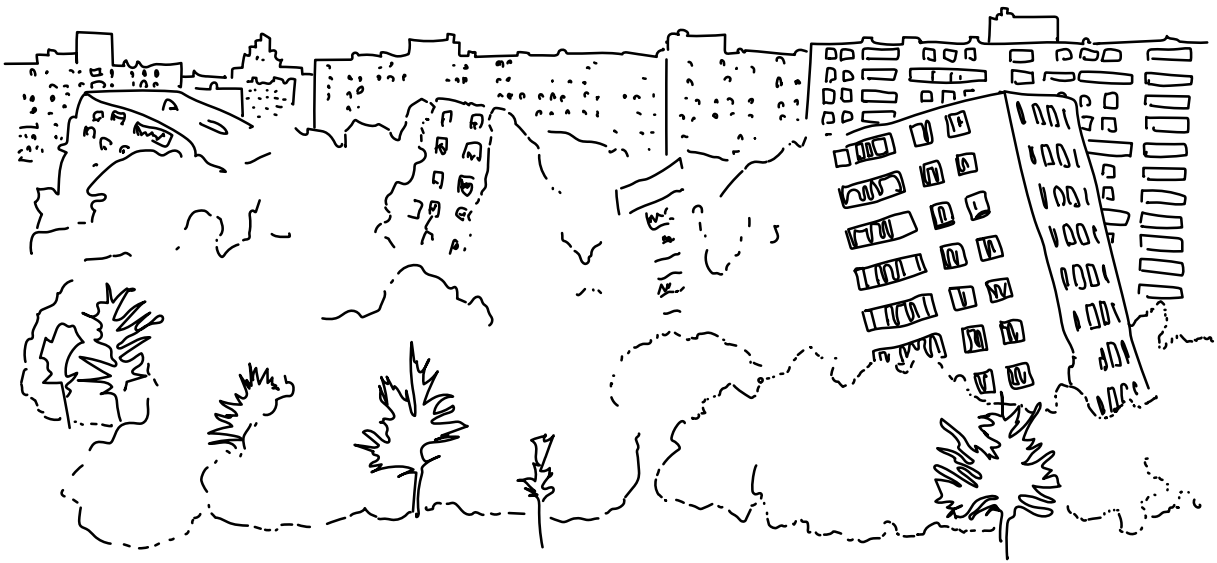
Considered an iconic failure, the social housing project Pruitt Igoe in St Louis, Missouri, can partly blame its infamy on maintenance. The project consisted of 33 eleven-story high rises, designed in the modernist architectural style by Minoru Yamasaki. The public money used to build the complex, allocated thanks to the Housing Act of 1949, did not include a maintenance budget. Money could not be found elsewhere to keep the project healthy. Pruitt Igoe rapidly degenerated. "One day the lift stopped working and never worked again" quoted one resident. The project was eventually demolished, and by 1976 all 33 buildings had been taken down.

00108: Today the city of Rome employs 100 gardeners, far fewer than in the year 2000 when 1500 gardeners looked after the city. A 2018 pilot project promoted by the "Five Star Movement" (political party) in Italy put "Prisoner-gardeners" to work maintaining municipal gardens — a problematic and coercive solution to the systemic underfunding of maintainers.

MAINTAINERS
Maintainers face challenges regarding their occupational status, income, job security, and other forms of support.

Key questions: Who are the Maintainers in your life? Describe who the maintainers are in your community. Are there any patterns you notice when you think about them? What are their similarities and differences? Is any training necessary to become a Maintainer? What is maintained when we practice maintenance?

00145: Open Source as Liturgy

There is a saying, "We are what we practice." Here, Pope Francis washes the feet of church-goers as a way to practice humility and maintain the connection to our shared humanity. The image is inspired by a presentation that explores how common actions or professional rituals among maintainers do or do not reflect a shared set of values and priorities. Individual values and beliefs influence how we do our work and how we relate to the people that we work with.

00145: Delayed while Pending Some Action: The Information Backlog as Deferred Maintenance

Different types of work have different relationships to time. Any type of maintenance work, for example, is aimed at keeping things usable over a long period of time. Archivists, "history's maintainers," use a range of different tools when they work with fragile or damaged historical documents. Archivists help to make decisions about which historical documents and objects are the most important for institutions to maintain for the future. It is important to make this work visible to visitors of the archives so they understand why the archives tell the stories of some people's experience and not others.

00148: Female Machine Operators and the Maintenance of the Factory System

Machine operators like these women working a machine at a Chinese cotton mill have traditionally been considered "unskilled". The reality is that the machine operators have a deep knowledge of how the machines work, and often fix machine errors at the same time that they are actively using them to create cotton thread. Without the machine operators, these machines could not do what they were designed to do. Many of the words we use to describe technology can make it sound like machines are doing most of the important work and people are just "tinkering". In reality, people are the ones that create technology, and keeping technology working requires constant intervention by people.

000141: "A blessing and a curse" — Alaska's governor Mike Dunleavy explains his permanent fiscal plan for future financial stability in Alaska. This plan involved making significant cuts to some services and infrastructure including the partial closure of the marine highway, prompting the protest illustrated on page 10.

The Governor's Permanent Fiscal Plan | Alaska Insight

think it's both been a blessing the curse I agree with them
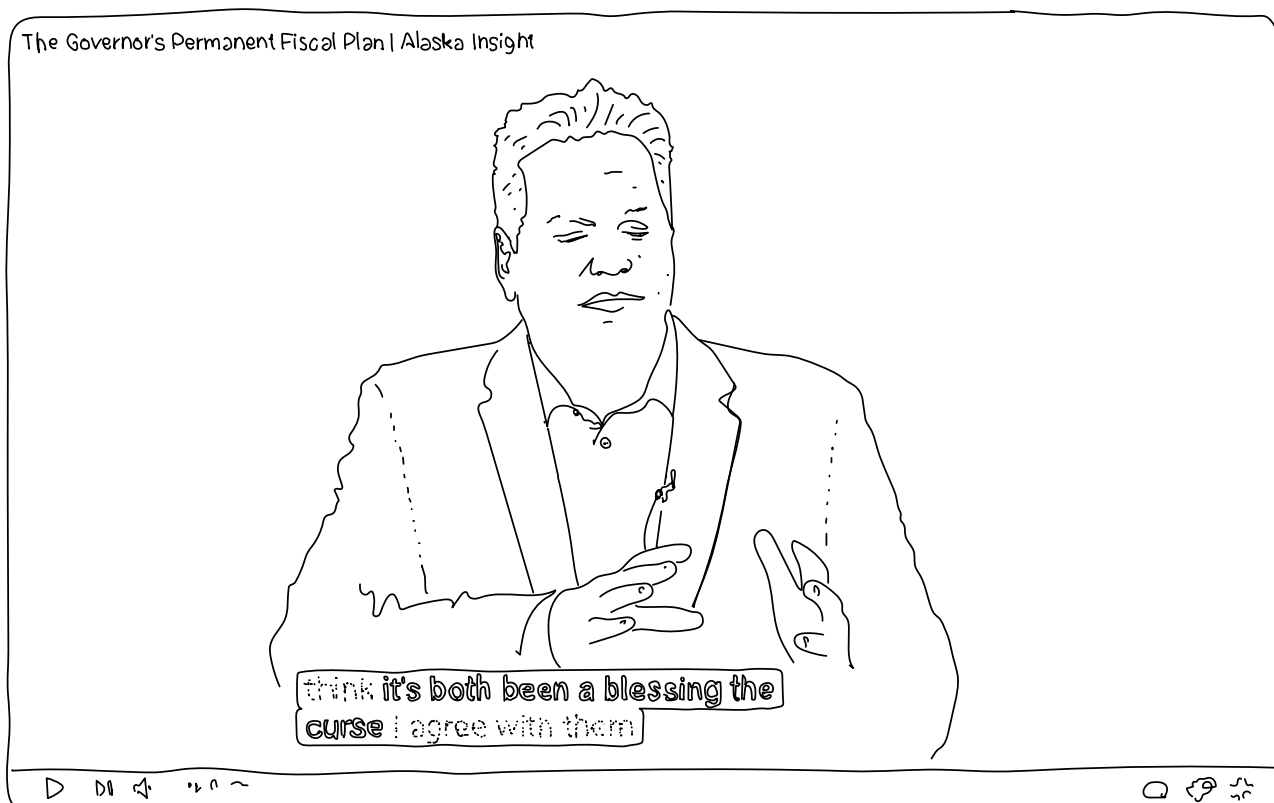
ECOSYSTEMS
The challenges of maintenance and maintainers are big and complex — including technology, people, and our natural environment.
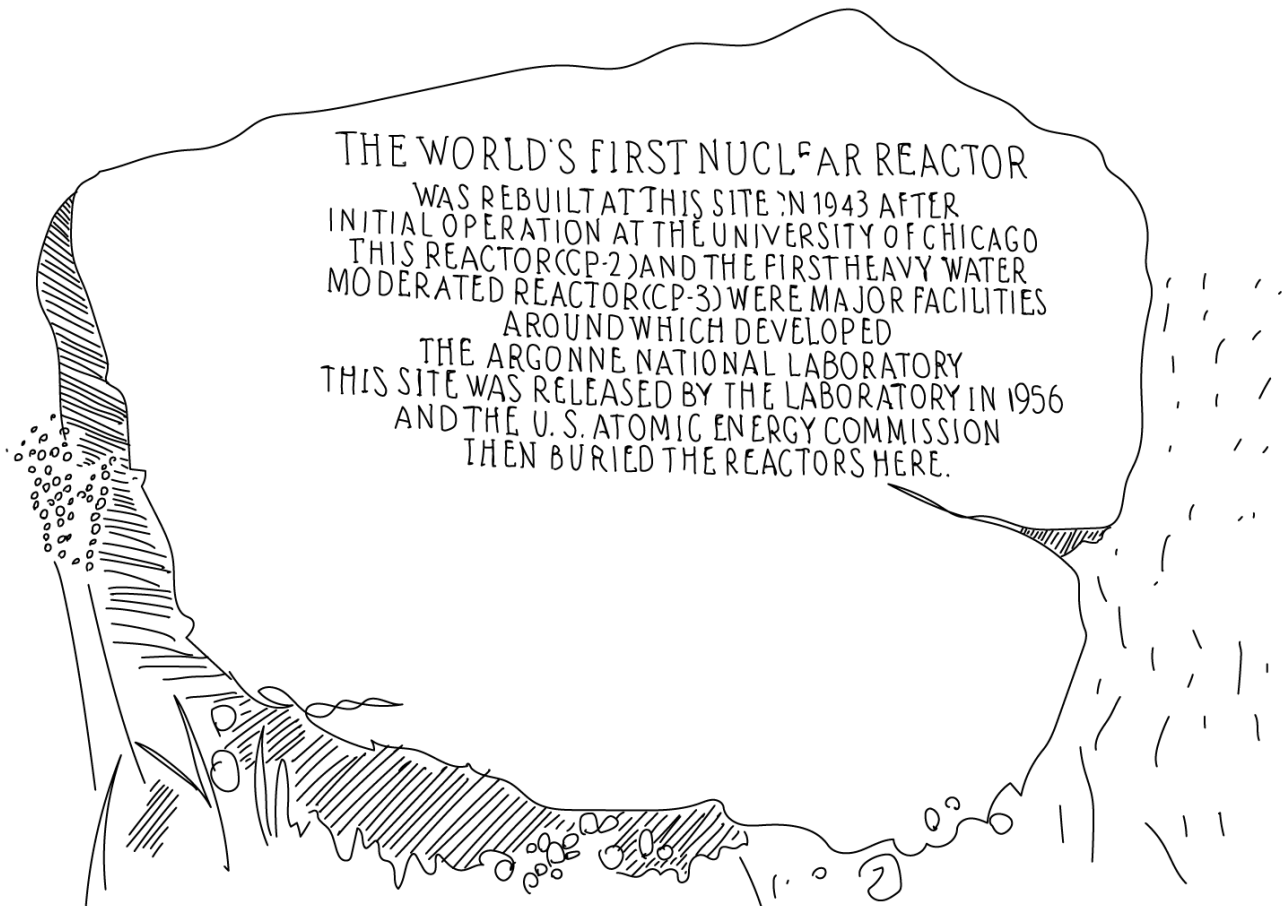
Key questions: How does your understanding of maintenance change when you consider the maintenance needed of the environment around you? What is relevant to your understanding of where you are and the systems to maintain your community? How do life experiences influence the way we relate to maintenance?

00144: Tsunami stones
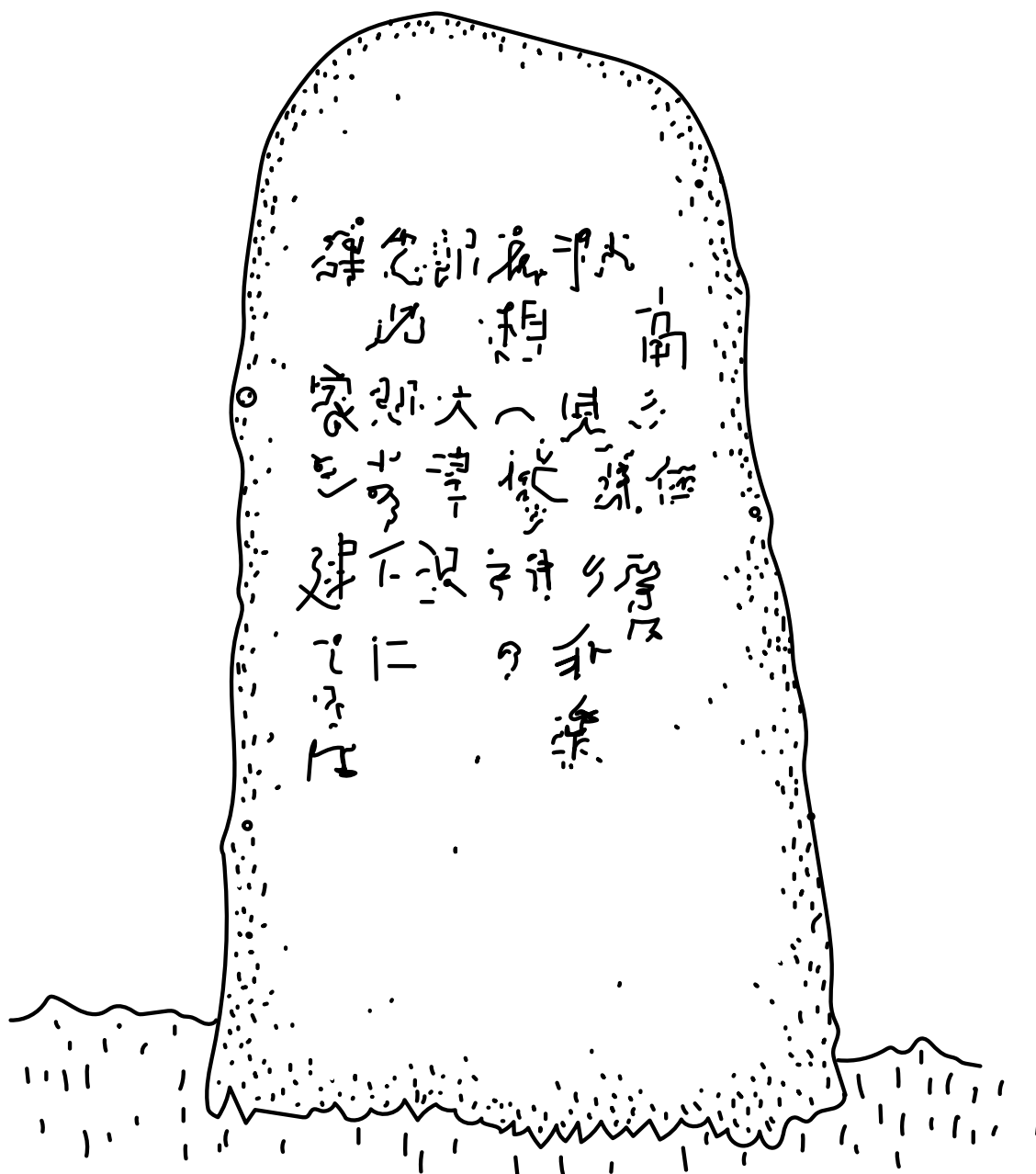
Memorials are places in the real world or online where people remember something together — like a person or an event. Memorials that last for a long time have to be maintained by the people that have a connection to the people or events being remembered. Tsunami stones, one type of memorial, are placed along the Japanese coast to let people know from what point they could safely build their houses to avoid tsunamis. The stone reads: "only build the house of your mother-in-law below this point".

00145: World first nuclear reactor grave site — stone plaque memorializing the world's first nuclear reactor

THE WORLD'S FIRST NUCLEAR REACTOR
WAS REBUILT AT THIS SITE IN 1943 AFTER
INITIAL OPERATION AT THE UNIVERSITY OF CHICAGO
THIS REACTOR (CP-2) AND THE FIRST HEAVY WATER
MODERATED REACTOR (CP-3) WERE MAJOR FACILITIES
AROUND WHICH DEVELOPED
THE ARGONNE NATIONAL LABORATORY
THIS SITE WAS RELEASED BY THE LABORATORY IN 1956
AND THE U.S. ATOMIC ENERGY COMMISSION
THEN BURIED THE REACTORS HERE.

A stone plaque memorializing the world's first nuclear reactor. The text reads "The World's First Nuclear Reactor was rebuilt at this site in 1943 after initial operation at The University of Chicago. This reactor (CP-2) and the first heavy water moderated reactor (CP-3) were major facilities around which developed The Argonne National Laboratory. This site was released by the laboratory in 1956 and the US Atomic Energy then buried the reactors here."

00149: Open Source Software as Critical Infrastructure: Legal Technologies and Institutional Design
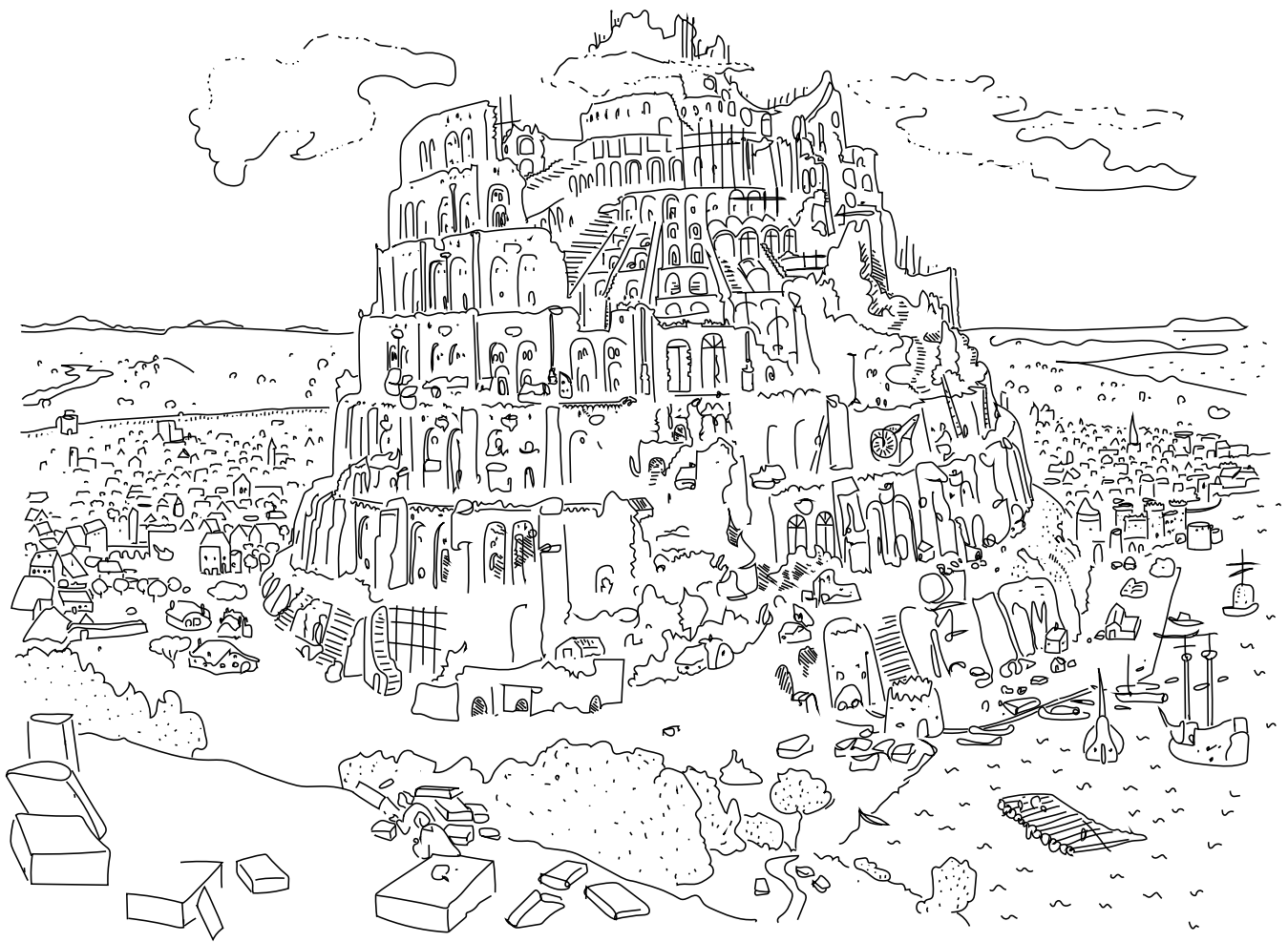
The story of the Tower of Babel tries to explain why there are so many different languages spoken in the world. Software is also written in many different programming languages, and the laws that tell us how we can use open source software vary from country to country. For a global open source community to work together across national boundaries and across software development projects, it takes a lot of people maintaining software libraries, laws, and the translation that allow those things to talk to each other.

## 00150: Autonomous Vehicles: Maintaining Inequality?
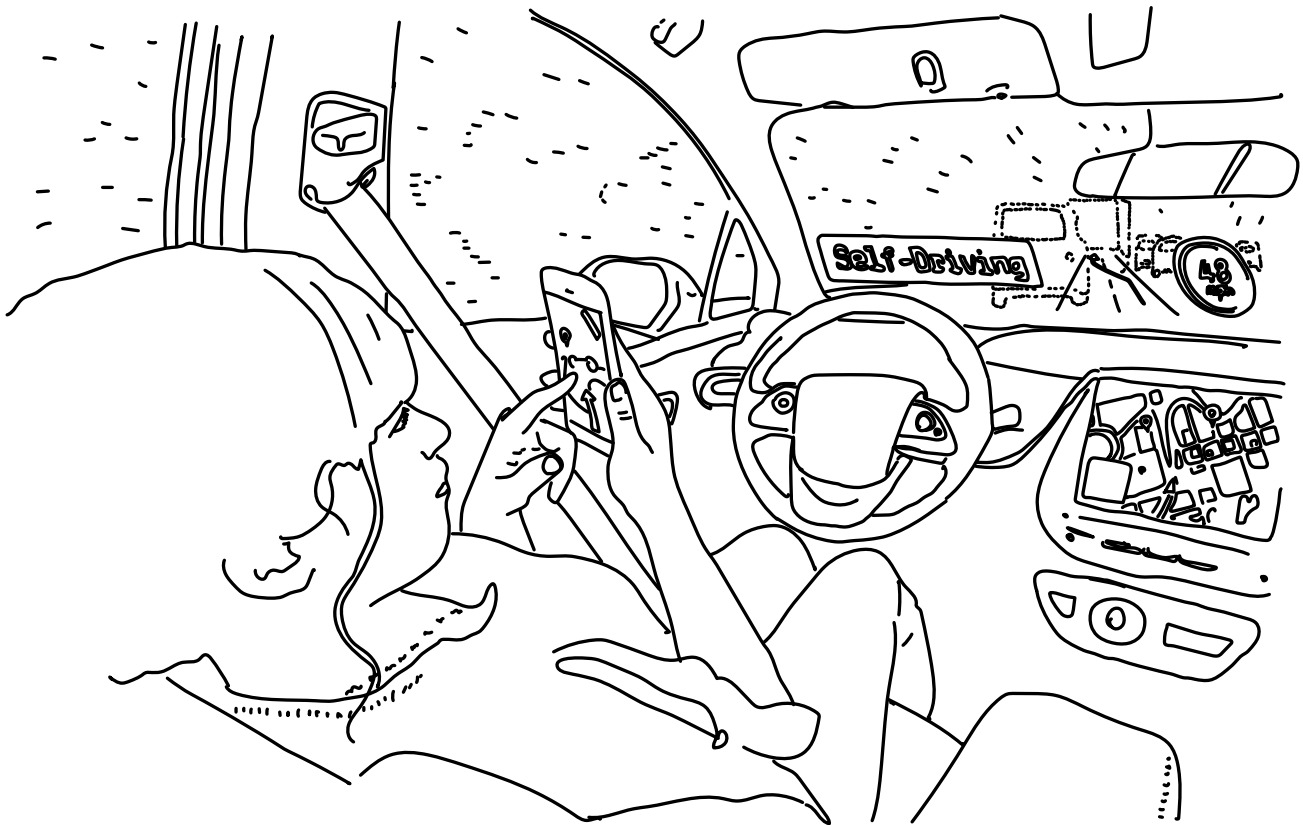
A driver in a self-driving car uses her cell phone while the car navigates its way through a city street. "Self-driving" cars are not truly autonomous — they are dependent on big systems built and maintained by people all over the world including the global positioning system (GPS), our national highway systems, and the Internet.

00151: Caring for People, Maintaining Systems: The Future of Infrastructure

A group of citizens in Flint, Michigan, waiting in line to collect drinkable water from aid workers after the main source of water for the city was found to be contaminated with lead. Maintaining proper water infrastructure is essential to conserve and transport this basic resource, but even more important to assure the quality of the water. Historically, many water pipes were made out of lead, which can leach into the water supply. If the water systems are not properly maintained the consequences for many can be dramatic.

00120: FixMyStreet is an open source map-based website used all over the world that helps people inform local authorities of issues like potholes and broken street lamps. Could we use this data to help us to participate in the design of the city, and not only fix it ? MAMA collaborated with the city of Brussels to answer this question.
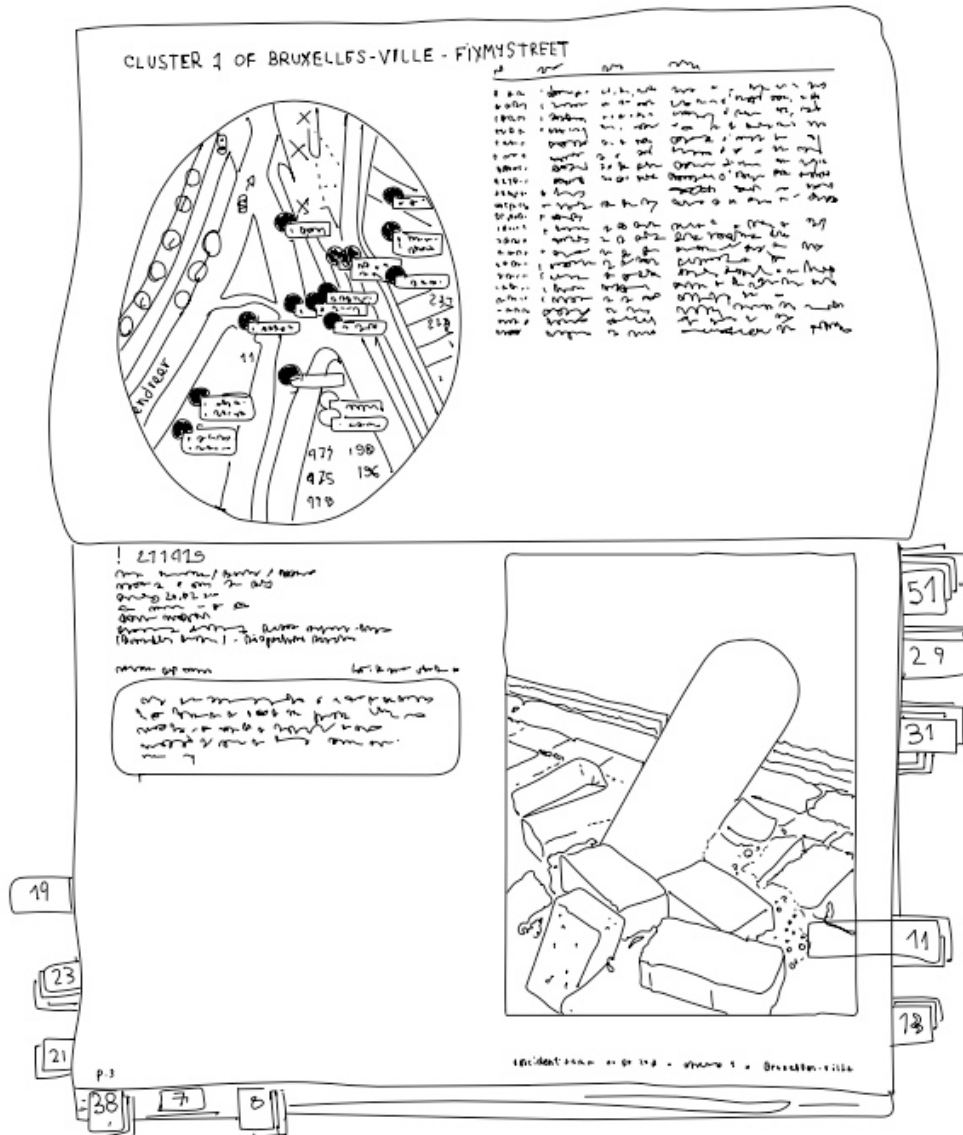
RESEARCH
## In all fields there is a need for better data about maintenance and maintainers.

Key questions: How does understanding maintenance enrich people's lives? How does thinking about maintenance attune you to your surroundings? Why is it important to document the work of Maintainers? How can you investigate the ways maintenance is visible in your life? Can you document it or is it something that is not tangible?

00142: Unpacking a Mesh Install Kit: An Object Lesson in Community Network Maintenance
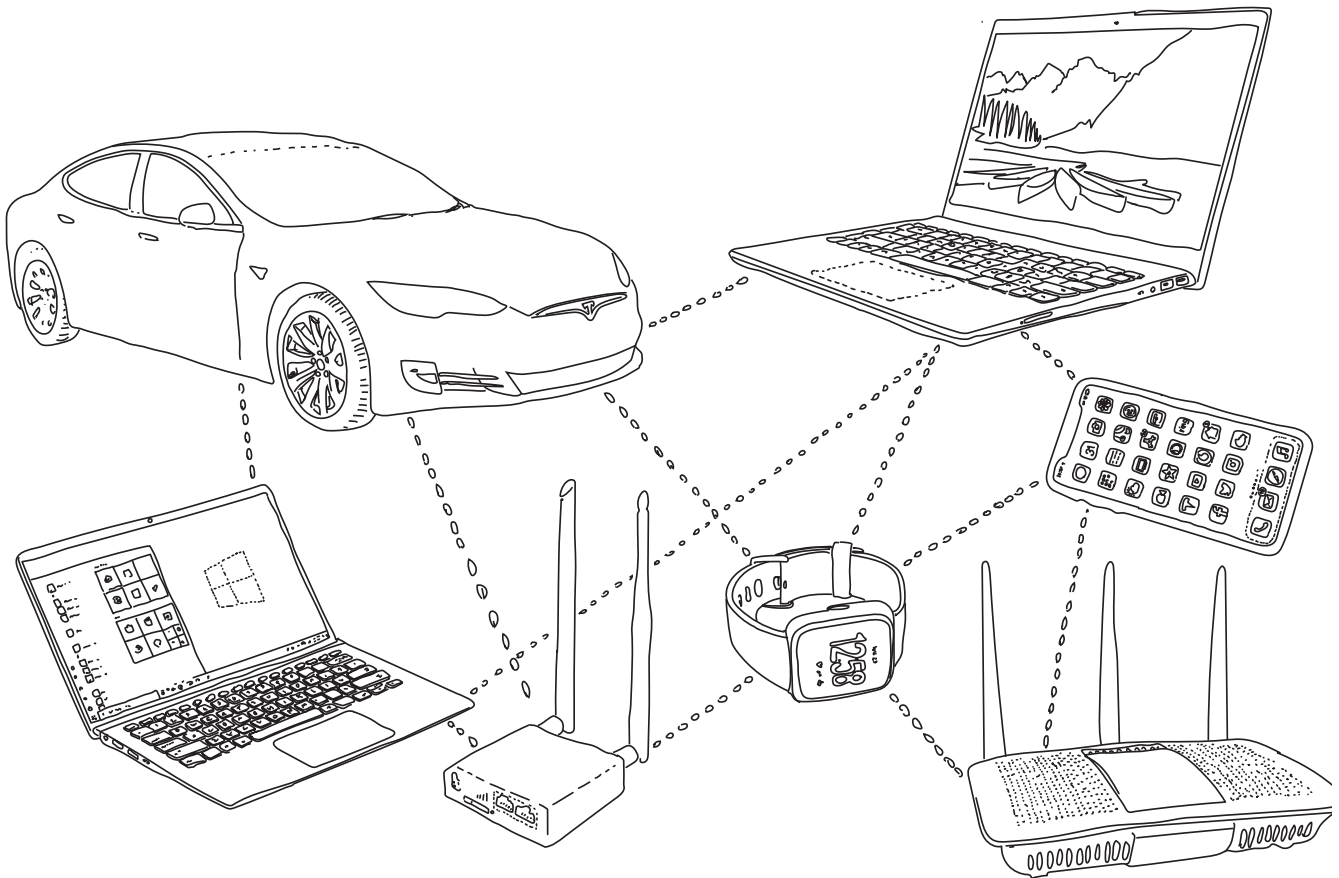
A car, laptop, cell phone and other "smart" devices can communicate the data they collect and store to each other across a network. While many of today's "smart" devices share data using shared Internet infrastructure, there are communities that build "mesh networks" – community owned and controlled networks that are set up and maintained by volunteers. Researchers are currently working with members of mesh networks to understand how they work together to keep the networks in working order.

00153: Invisible Work in Highly-Visible Roles? Examining Burnout in Free/Open-Source Software Maintainers
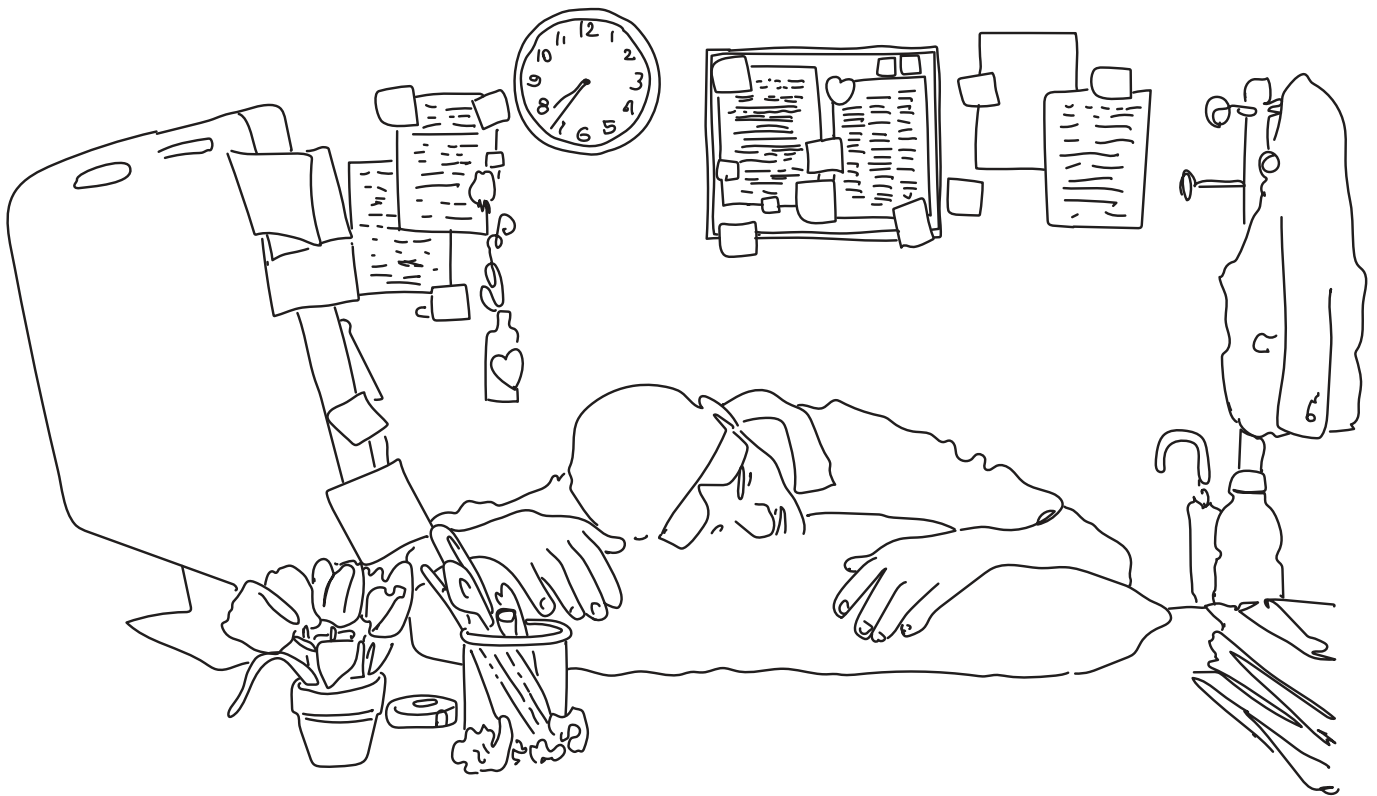
An office worker sleeps at their desk, exhausted due to burnout. "Burnout" happens when people are tired and overworked, and their bodies cannot maintain the pace at which they are working. Maintainers commonly experience burnout. In order to understand why, social scientists are asking maintainers about how they organize their time, how many hours they work, how they decide what to work on, who they have to report to, and whether they feel that others see value in their work.

00085: Addressing Planning Fallacy in Infrastructure Investment Decision Making
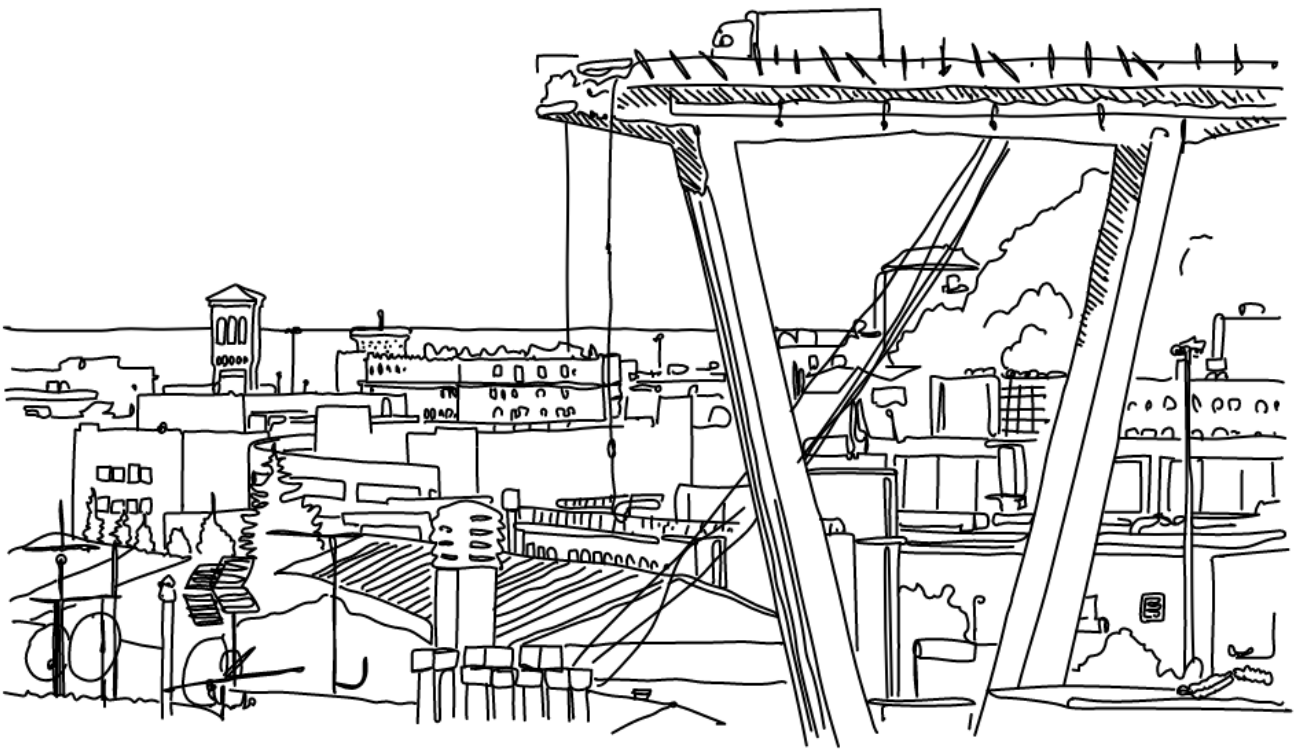
Roads, bridges, trains, waterways, and other parts of our transportation system are expensive to build, impact the lives of many people, and can be challenging to complete, like this unfinished highway overpass. These projects require cooperation of many different groups that may have different ideas about what is most important including private companies, government agencies, and land and business owners. Researchers are currently studying the differences in the ways that people in the United States and the United Kingdom decide on the costs of infrastructure projects.

Takeaways

As you've seen throughout this book: maintenance is central to our lives. And it can surprise us in any number of ways. How have you made new connections between Maintenance, Maintainers, Ecosystems, or Research? Is there a maintenance skill that you are interested in learning?

MAINTENANCE
What role does persistence play in maintenance? Who is maintenance done by? How is maintenance organized? How do you maintain materials, tools, and equipment for everyday life?

MAINTAINERS
Who are the Maintainers in your life? Describe the maintainers in your community. Are there any patterns you notice when you think about them? What are their similarities and differences? Is any training necessary to become a Maintainer?

ECOSYSTEMS
How does your understanding of maintenance change when you consider the maintenance needed of the environment around you? What is relevant to your understanding of where you are and the systems to maintain your community? How do life experiences influence the way we relate to maintenance?

RESEARCH
How does understanding maintenance enrich people's lives? How does thinking about maintenance attune you to your surroundings? Why is it important to document the work of Maintainers? How can you investigate the ways maintenance is visible in your life? Can you document it or is it something that is not tangible?

Questions have been modified from: NYS Common Core Arts Standards At-A-Glance (http://www. nysed.gov/curriculum-instruction/arts-standards-implementation-resources)

Connecting further

We hope you have enjoyed the opportunity to enrich and add some color to your ideas about maintenance, and we invite you to share your drawings and ideas with us!

Please reach out to us via themaintainers.org/connect.

Endnotes

Pages 6 and 7: Illustrations created as part of MAMA's research practice.

Page 8: Illustration based on a presentation by Julie Hochgesang, "Maintaining the Stories of the Deaf Communities at Gallaudet," General Track Meeting Notes, pp. 15-16, https://bit.ly/2rGt8V3.

Page 9: Illustration based on a presentation by Ryan Ellis and Yuan Stevens, "A Valuable Flaw: Bug Bounty Programs, Software Maintenance, and Infrastructure Labor" https://sched.co/Sgej

Page 10: Illustration based on a presentation by Alice Goldfarb, "Done, if by Sea: Consequences of the Potential End to the Alaska Marine Highway System," https://sched.co/SgfJ

Page 11: Illustration based on a panel including Kendra Albert, Simmi Kaur, Sei Young Pyo, and Chuck Roslof "Lawyering as Maintenance," https://sched.co/SgdN

Page 12: Illustration created as part of MAMA's research practice.

Page 13: Illustration created as part of MAMA's research practice.

Page 14: Illustration based on a presentation by Henry Zhu, "Open Source as Liturgy", https://sched.co/Sgem

Page 15: Illustration based on a presentation by Ciaran Trace, "Delayed while Pending Some Action: The Information Backlog as Deferred Maintenance," https://sched.co/U8q9

Page 16: Illustration based on a presentation by Yuan Yi, "Female Machine Operators and the Maintenance of the Factory System" https://sched.co/Sgct

Page 17: Illustration based on a presentation by Alice Goldfarb, "Done, if by Sea: Consequences of the Potential End to the Alaska Marine Highway System," https://sched.co/SgfJ

Page 18–19: Illustrations based on a presentation by Chelsey Gunn and Aisling Quigley, "Memorialization as Maintenance" https://miii.sched.com/event/U8q9

Page 20: Illustration based on a panel featuring Benedict Kingsbury and Thomas Streinz discussing "Open Source Software as Critical Infrastructure: Legal Technologies and Institutional Design" https://miii.sched.com/event/SgfD

Page 21: Illustration based on a presentation by Carole Voulgaris entitled "Autonomous Vehicles: Maintaining Inequality?" https://miii.sched.com/event/SgfS

Page 22: Illustration based on a presentation by Deb Chachra entitled "Caring for People, Maintaining Systems: The Future of Infrastructure" https://miii.sched.com/event/Sgfw

Page 23: Illustration created as part of MAMA's research practice.

Page 24: Illustration based on a presentation by Rory Solomon entitled "Unpacking a Mesh Install Kit: An Object Lesson in Community Network Maintenance" https://miii.sched.com/event/U8rt

Page 25: Illustration based on a presentation by Stuart Geiger entitled "Invisible Work in Highly-Visible Roles? Examining Burnout in Free/Open-Source Software Maintainers" https://miii.sched.com/event/Sgf4

Page 26: Illustration based on a presentation by Jung Eun Park entitled "Addressing Planning Fallacy in Infrastructure Investment Decision Making" https://miii.sched.com/event/SgfM

MAINTAINERS