Open Data Literacy:

Washington State Library Summer Internship Final Report

15 August 2018

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# *Abstract*

*Open government data advocates believe this relatively new information source can improve government transparency and efficiency and provide a platform for innovation, but much of the general public remains unfamiliar with it. An environmental scan conducted during the Open Data Literacy summer internship at the Washington State Library explored two little-researched topics: the extent of open data published by local government, and public libraries’ roles in open data publishing and instruction. Librarians contacted believed open data to be strongly tied to the library’s core mission, and said libraries should offer instruction to patrons, although they differed on whether to offer classes or instruct patrons individually as needed. Many libraries also wanted to help local government publish open data, by sharing library expertise in working with users, using data to demonstrate value, and embracing open information. While two thirds of Washington State’s counties and a handful of large cities were found to be publishing open data, most of the data was Geographic Information System (GIS) maps of boundaries and landmarks -- not public safety incidents, traffic activity or other data popular with the public. Based on librarian recommendations, I recommend the State Library add a central open data resource guide to the “Library Services” section of its website, and explore options for providing a statewide platform for local open data publishing.*

# Background and Literature Review

Advocates say open government data can improve government transparency and efficiency and spur innovation (Borgesius, Gray & van Eechoud, 2015). However, the public isn’t participating heavily in open government data portals such as data.gov, which received fewer than 360,000 visitors in October and November of 2015 (Sayogo, Wang, & Yuli, 2016). Public libraries have traditionally connected the public with promising new information sources and have been promoted as a bridge between open government and the public (Sayogo et al., 2016), but little scholarly research exists about public library open data activities.

Searches for recent scholarship on public libraries and open data (using descriptors such as *open data, open data movement* or *open government*) yielded a handful of papers about open data publishing by one library (Burton, 2017), a 2014 open data hackathon at Edmonton Public Library (Carruthers, 2014) and grant-sponsored open data projects at Boston and New York public libraries (Ayre & Craner, 2017). Several other papers emphasize the potential for libraries in open data publishing (Jackson, 2015), instruction (Greenwalt, 2014) or other roles such as managing data and advising publishers (Townsdin, 2018; Zhan & Widen, 2017), rather than documenting current library activities.

The ODL internship’s environmental scan of open data activities at public libraries thus helps to fill a research gap. Since the State Library already supports public libraries across Washington State with various services, it is a logical place to gather information and disseminate findings.

## Research questions

The environmental scan examined three issues:

* What open data activities are public libraries engaged in now, and what would they like to engage in?
* How many Washington State localities currently publish open data?
* How might the Washington State Library support open data through public libraries?

# Methods

## Public library open data activities & State Library support

To identify current open data activities and interests among public libraries, and identify ways the State Library could support such activities, I did the following:

* Spoke with public librarians participating in Data Equity for Main Street, a John S. and James L. Knight Foundation program in open data literacy curriculum at mostly public libraries in Washington State and California. Data Equity developed a four-class curriculum in open data for the general public; librarians have been pilot-testing the curriculum over the past year. I interviewed or exchanged email with librarians from all seven participating public libraries in Washington, and three others in California. I also reviewed Data Equity’s project website for evaluative comments.
* Contacted a sample of non-Data-Equity public libraries in Washington, choosing two from each service population tier (more than 250,000 people; 100,000 to 250,000; 25,000 to 100,000; 5,000 to 25,000; under 5,000 with a certified librarian; under 5,000 with no certified librarian). I sent emails to library directors, and sent another round of emails to those who did not respond at first. I interviewed librarians from seven of the libraries, exchanged email with two, and reviewed websites of three libraries who could not otherwise be reached.

These conversations explored whether the libraries published open data, taught open data or worked local government to get open data published. Advising local government publishers was a particular interest for Washington State Librarian Cindy Aden (C. Aden, personal communication, June 19, 2018), who wondered if high-quality open data might reduce the thousands of public records requests that strain staff and cost state and local governments more than $60 million a year (Washington State Auditor’s Office, 2016). I asked librarians to assess any activities they had undertaken, and to comment on how these activities met the needs of their service communities. For libraries not yet engaged in open data activities, I asked about their interest in doing so. Finally, I sought suggestions about how the State Library might support open data activities at libraries.

## Local government open data publishing

To survey current local government open data publishing, I searched for open data published by Washington’s 39 counties and the largest city in each county, using population counts generated by the state’s Office of Financial Management (2017). Specifically, I conducted Google searches for “open data [*name of locality*]” and also searched the locality’s official website for “data” and “GIS.”

# Findings

## *Note on citations*

*The research on open data activities at public libraries consisted of personal communication in July and August 2018. In order to avoid cumbersome repetition, interviews supporting particular findings are cited using an anonymous identifier only (e.g., DEMS1). DEMS librarians participated in Data Equity; ND librarians did not. AR signifies staff from the Washington State Archives. The Appendix lists identifiers with brief descriptions of the speaker’s responsibilities and the institution’s service area.*

## Open data publishing by public libraries

Only two of the libraries contacted were publishing open data from the library itself. A Washington library publishes its current collection inventory and item checkout data (ND5); a California library publishes historical data from its local archive (DEMS5). A few others had data in the pipeline with a local open data portal (DEMS4, DEMS9) or were working on publishing cultural heritage data (ND7). Several others expressed interest in publishing library open data, especially if they had toolkits, best practices and other support to ease the process (DEMS3, ND1, ND2, ND6, ND8). Two libraries expressed interest in hosting a data portal, for library or other local data publishing (DEMS9, ND8).

Although generally positive about open data, libraries face the same challenges as other publishers. Many librarians noted their limited time and capacity and specifically mentioned competing projects (DEMS2, DEMS3, DEMS8, DEMS9, DEMS10, ND1, ND3). One library that already publishes open data described tedious technical difficulties: Because the library and city have separate online domains, the library could not easily upload data and sometimes had to have a city employee help fill in electronic forms (ND5). Protecting privacy required time and careful attention: The library’s open checkout data doesn’t include location, for example, to avoid anyone trying to identify patrons by matching location and checkout times (ND5). Like many other data publishers, library managers also worried about negative public reaction to published data (ND5). Such concerns did not alter choice of datasets to publish; the library staff instead talked about how to contextualize information with more data, thorough metadata and open communication (ND5).

## Open data instruction

Open data instruction was almost entirely confined to Data Equity libraries. Just one other library had offered instruction, in 2017 workshops for the public and staff (ND5). Most Data Equity libraries had conducted classes for the public (DEMS1, DEMS4, DEMS5, DEMS7, DEMS8, DEMS9) or staff (DEMS3, DEMS5, DEMS6, DEMS8, DEMS10), and one had used the curriculum for presentations with city department heads (DEMS2). A few other Data Equity libraries hope to teach public classes in Fall 2018 or later (DEMS2, DEMS3, DEMS6).

### Evaluation of public instruction

Instructing librarians found a natural connection between open data instruction and the library’s mission to support information access, equity, empowerment and literacy, and many expressed strong feelings of commitment to this role (DEMS1, DEMS2, DEMS3, DEMS4, DEMS5, DEMS6, DEMS7, DEMS8, DEMS9). Several librarians underscored open data’s role in fostering a strong democracy, either by nurturing critical thinking and verification skills (DEMS1, DEMS2, DEMS4), or simply encouraging democratic participation, on one’s own terms (DEMS12).

Other strengths of public instruction included the following:

* Participant evaluations were generally positive (DEMS4, DEMS5, DEMS7, DEMS9) and participants were enthusiastic, sometimes driving across town to participate (DEMS7). Class participants especially liked Data Equity’s scavenger-hunt exercises (DEMS4), mapping and other data visualization tools (DEMS4, DEMS7) and tips on how to catch poor or deceptive data analysis (DEMS4).
* Instructors generally found the curriculum sound, with some noting that the material could easily be adapted to different audiences (DEMS2, DEMS7, DEMS9).
* Several library directors said early exploration of a new information source was good for the library strategically, and helped the library focus on how best to serve patrons (DEMS1, DEMS5, DEMS8, DEMS9). Collaboration among libraries during the DEMS project was also beneficial (DEMS2, DEMS9).

The most common challenge for public instruction was attendance. Some classes had as many as eight or more class participants (DEMS4, DEMS5), but others reported having just one or two participants (DEMS1, DEMS7). One library not only did standard marketing with flyers and calendar postings, but personally reached out to 20 community activist groups, only to have two or three people attend its public open data workshop (ND5). When asked what support instructing librarians needed, several librarians said marketing and outreach materials were critical (DEMS2, DEMS3, DEMS5).

Instructors also reported challenges accommodating different experience levels (DEMS4) or participants with specific political or professional interests (DEMS1, DEMS7). A few librarians wondered if their service communities had enough patrons interested in answering questions by finding and interpreting raw data (DEMS1, ND3).

For future public instruction, Data Equity librarians said they might depart from the four-class series format -- for example, focusing on popular topics such as property (DEMS1). Other Data Equity librarians suggested tying instruction to other programming such as health literacy (DEMS6), to elections (DEMS3) or to particular groups such as environmentalists or nonprofits (DEMS3, DEMS9). Generating e-curriculum would allow patrons to learn on their own schedule (DEMS5).

Some libraries that hadn’t yet offered instruction were interested in Data Equity curriculum, for staff training at the least and especially if local government began publishing more open data (ND1, ND2, ND6). Many librarians agreed that reference librarians should be familiar with open data sources and tools, and prepared to instruct patrons individually if open data met their needs. Patrons often don’t attend classes, even when they’ve asked for classes on a topic, but respond well to just-in-time individual instruction, one librarian said (ND6).

### Response to staff instruction

By contrast, staff training was well attended and generated high enthusiasm. Librarians reported having 30 to 50 staff members attend workshops (DEMS5, ND5), even on librarians’ days off (DEMS5). Organizers received emails of thanks, examples of how librarians had used data visualization and other new skills, and requests for future instruction (DEMS3, DEMS5, ND5). One library director decided to train all of the staff after early success training a few key staff members (DEMS6), and some Data Equity librarians expressed willingness to train librarians in other systems (DEMS1, DEMS3).

Many libraries were drawn to learn more about open data in order to improve the library’s own internal use of data, to track performance and demonstrate value (DEMS3, DEMS5, DEMS6, ND1, ND2, ND5). Improving internal data use allows staff to directly experience the rewards of good data management, one librarian noted (ND5).

## Advising local government about open data publishing

Advising local government about open data publishing was the open data role that most interested the libraries contacted. Two Data Equity libraries in Washington state are already working as partners with their respective cities to launch or upgrade open data portals. They are part of the city’s open data leadership team (DEMS2, DEMS9) and have used the Data Equity curriculum to teach city department heads about open data (DEMS2). One library is discussing sharing staff and portal oversight with the city (DEMS9). Another large library system in California already works with its city on emergency planning, digital privacy and education, and intends to work with the city on improving its open data portal (DEMS5).

In these cases, librarians said, city leaders recognized qualities that made libraries natural allies in open data publishing:

* *Libraries are user experts*. Libraries serve a broad swath of the community, are familiar with community preferences and use this understanding in choosing high-quality, meaningful materials within time and budget constraints (DEMS1, DEMS2, DEMS5, DEMS9, DEMS11). Libraries also constantly observe how real people seek and use information (DEMS2, DEMS5, DEMS9).
* *Libraries have long experience using data to demonstrate value*, and can share this experience with publishing agencies who want to demonstrate their own value to the public (DEMS2, DEMS5).
* *Libraries are experienced advocates for open information* and can help publishing agencies that are anxious about data being “misinterpreted.” Librarians can demonstrate how to use metadata to put data in context (DEMS2), provide more data to fill in the picture (ND5), or simply talk openly with the public (DEMS2, ND5) -- all of which are more effective than hiding (DEMS2). They are also a friendly, trusted advisor (DEMS9).

Most librarians contacted agreed that such expertise made libraries natural publishing allies, and many were interested in a larger advising role. Libraries had already spoken informally with local government about data publishing (DEMS1), believed a partnership might evolve from the library’s own open data efforts (DEMS6), or expressed interest during interviews in working with local government open data efforts (DEMS8, ND1, ND2, ND4, ND5, ND6) and even hosting a publishing portal (ND8).

## The state of local government open data

Local open government data showed room for expansion and improvement. Of the 39 Washington counties and their largest cities surveyed, 26 counties and eight cities were publishing some kind of open data. However, the overwhelming majority of the data was GIS maps of boundaries, districts and other physical landmarks -- not data about activity such as permitting, government spending, criminal incidents or traffic flow. These popular types of data are among the more heavily viewed datasets on Seattle’s large open data portal, for example, (City of Seattle, 2018).

Just eight counties and six cities surveyed appeared to be publishing open data on public safety activity, property sales, traffic activity, or permitting and licensing. Moreover, the presentation and documentation ranged from well documented and user-friendly to bare files. (Examples and the full dataset of findings, along with supporting documentation, may be found at <https://github.com/OpenDataLiteracy/WA-State-Library-2018/tree/master/FinalReports>).

Data about localities is often still available, just not from local agencies themselves. Washington State’s open data portal (<https://data.wa.gov/>) publishes state agencies’ data about localities (e.g., juvenile offenses). Eastern Washington University’s Institute for Public Policy and Economic Analysis and Center for Digital Media Design and Development have also worked with various community groups to generate *Community Indicators* data portals for 12 Washington State counties (<http://www.communityindicators.ewu.edu/loc_map.cfm>), drawing largely on federal and state data.

Many local government agencies are still struggling with paper records management (AR). In 2017 the Washington State legislature [created a records management grant program administered through Washington State Archives](https://www.sos.wa.gov/archives/recordsmanagement/local-records-grant-program.aspx) (Washington State Archives, 2018a). Half of the first round of grants went simply to organize paper or other physical records (Washington State Archives, 2018c). Of the technology grants awarded, many were for software to track records requests, not necessarily to get the records themselves online (Washington State Archives, 2018b).

# Recommendations

Findings from the environmental scan provide promising evidence that public libraries can support both publication and use of high-quality local open government data. Building on these findings and suggestions from the librarians contacted, I recommend the State Library take the following steps:

* **Create a central open data resource guide,** under the [Library Services section of the State Library’s website](https://www.sos.wa.gov/library/libraries/all-services.aspx). The guide would include resources suggested by interviewed librarians: curriculum (Data Equity’s curriculum will soon be available in a public repository) (ND1, ND2, ND6); toolkits, best practices and tips for getting started (DEMS5, DEMS9, ND6); training in leadership and advocacy (DEMS5, DEMS9), curated and annotated open data resources (ND3), and marketing materials (DEMS2, DEMS3, DEMS5). The guide could also house open data literacy e-curriculum (DEMS5), as it becomes available.
* **Explore options for providing a platform for local open data**. A few librarians recommended the State Library or statewide agency provide standard infrastructure for publishing local open data (DEMS1, ND8). Such infrastructure would remove a publishing roadblock and clear a path for libraries to shine in an advisory role to which they are supremely suited. A statewide platform would also normalize open data presentation across localities. The library could evaluate existing options and costs, and identify likely statewide agencies or organizations for hosting such a platform.
* **Make State Library public library statistics a little more open**. Most state libraries publish statistics about the state’s public libraries, and the Washington State Library has long published up-to-date, machine-readable statistics, although in multi-tab Excel spreadsheets. In response to ODL recommendations, the Washington State Library has already updated its 2017 statistics to a one-tab spreadsheet (easier to process by machine) in a comma-separated values (.csv) non-proprietary format.
* **Connect open data and other State Library services**, such as library professional development, and support for tribal libraries, youth services and digital literacy programs.

## Areas for further research

This environmental scan provides a foundation for further research, specifically the following:

* Learn more about localities where local agencies and libraries are working together on open data publishing. Talk to library and other government officials about what supports the partnership; identify other localities where such conditions might support a similar partnership. Develop and track measures for success, including the extent to which open data publishing correlates with more manageable public records requests.
* Develop measures for tracking outcomes of open data literacy education and training (suggested by DEMS5).
* Build on the local open data publishing scan by adding more localities (other cities, as well as other local governing bodies such as ports or hospital districts) and evaluating the quality of local open data publishing (e.g., variety of data provided, adequacy of documentation, currency, accuracy, ease of use).

# Acknowledgments

For support and excellent advice, I thank Nic Weber, Carole Palmer and Bree Norlander at the Open Data Literacy Project, University of Washington iSchool; Washington State Librarian Cindy Aden and the welcoming Library Development staff at the Washington State Library, especially Evelyn Lindberg; and Will Saunders, Debbie Faires and Anne Neville at Data Equity for Main Street.

I’m grateful to the many busy librarians, archivists and other staff who made themselves available for interviews. Thank you.

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**Appendix**

Following are identifiers and information about public libraries included in the internship’s environmental scan.

# Data Equity for Main Street (DEMS) participating libraries

*DEMS librarians worked at either Washington State or California public libraries.*

* **DEMS1** is the director of a Washington State municipal library serving between 25K and 100K people, in an agricultural area with multiple library systems. The city doesn't publish open data; the surrounding county publishes limited GIS open data. A university-community partnership has produced a separate data portal for the area, using mostly federal and state public datasets. *Interview on 2018-07-05.*
* **DEMS2:** DEMS2a is a manager librarian and DEMS lead for a Washington State municipal library serving between 100K and 250K people. DEMS2b is the library director, who took over in the past year. The surrounding county provides a limited selection of GIS open data. The library has recently become involved in the city's efforts to launch an open data portal. *Interview on 2018-07-05.*
* **DEMS3** is the director of a California municipal library serving about 200K people. The city doesn't have an open data portal; the surrounding county has some information and statistics online, but just a few Excel spreadsheets that can be downloaded. *Interview on 2018-07-12.*
* **DEMS4** is the integrated library systems coordinator for a California municipal library serving more than 1 million residents. The city and surrounding county both have open data portals, as well as a Code for America chapter (which advocated for the city launching an open data portal). *Interview on 2018-07-12.*
* **DEMS5:** DEMS5a & DEMS5b are innovations manager and web librarian for a California municipal public library serving about 1 million people. The city and surrounding county both have open data portals. The area has many colleges and universities, technology employers and a Code for America chapter. *Interview on 2018-07-13.*
* **DEMS6** is the director of a Washington State municipal library serving 25K to 100K people. The library's city doesn't publish open data; the county and its largest city publish limited open data, mostly GIS. A university-community partnership has produced a separate data portal for the area, using mostly federal and state public datasets. *Interview on 2018-07-19.*
* **DEMS7** is a librarian at a Washington State large county library serving more than 250K people. The county includes a large city as well as colleges and universities. Both the city and county publish some open data. A university-community partnership has produced a separate data portal for the area, using mostly federal and state public datasets. *Interview on 2018-07-23.*
* **DEMS8** is the director of a Washington State smaller county library serving between 5K and 25K people. The local governments don't publish any open data. *Interview on 2018-07-24.*
* **DEMS9** is the community technology director at a Washington State large municipal library serving between 100K and 250K people. Its city and county both have open data portals, and the city and library are collaborating on open data services. A university-community partnership has produced a separate data portal for the area, using mostly federal and state public datasets. *Interview on 2018-07-27.*
* **DEMS10** is the information technology manager for a Washington State rural county library serving 5K to 25K people. The county publishes limited GIS open data. A university-community partnership has produced a separate data portal for the area, using mostly federal and state public datasets. *Response by email on 2018-07-16.*
* **DEMS11** helps lead the Data Equity project and works with state government agencies on open data publishing. *Remarks on 2018-07-05.*
* **DEMS12** helps lead the Data Equity project and works in nonpartisan public policy research for a state agency. *Remarks on 2018-08-03.*

# Non-Data-Equity (ND) Libraries

*All libraries below are in Washington State.*

* **ND1** is the technology and collections manager of a smaller municipal library, serving about 25K people, although it also serves other patrons through a cooperative venture with other areas. The library's town has recently launched an open data portal, as part of an "open government" initiative. *Interview on 2018-07-19.*
* **ND2** is the director of a municipal library serving about 55K people, between the city itself and some patrons from the surrounding county. The city does not publish open data; the county publishes limited GIS open data. *Interview on 2018-07-23.*
* **ND3** is library director of a small municipal library serving more than 10K people, between the city and non-municipal patrons. The library's service population has more than doubled in the past 15 years, since the library opened. The city is close to open data portals in a nearby large city and the surrounding county. A university-community partnership has produced a separate data portal for the area, using mostly federal and state public datasets. *Interview on 2018-07-23.*
* **ND4** is the director of a large municipal library serving 100K-250K people, with between 6 and 10 locations. ND4 took over the library directorship in the past year. Both the city and surrounding county have open data portals. *Interview on 2018-07-24.*
* **ND5** is a data analyst and instructor for a large municipal library serving a diverse population of more than 250K people. Both the city and the surrounding county publish extensive open data. The city and surrounding area have many residents who work for technology companies. The area also includes many colleges and universities, and a Code for America chapter. *Interview on 2018-07-24.*
* **ND6** is the director of a small rural library system spread out over a large area and several branches, serving fewer than 5K people with a certified librarian. Local government agencies do not currently publish open data. *Interview on 2018-07-25.*
* **ND7** is an archive librarian for a large county library system serving between 100K and 250K people. The local largest city and the county both publish open data. A university-community partnership has produced a separate data portal for the area, using mostly federal and state public datasets. *Email response on 2018-08-09.*
* **ND8** is the head of digital services for a municipal library serving about 86K people. The city and local county publish some open data, mostly GIS. *Interview on 2018-07-27.*
* **ND9** is a small library serving under 5K people, with a certified librarian. The surrounding area is a recreational getaway. The library's immediate location doesn't publish open data; the surrounding county publishes mostly GIS data. *Website reviewed 2018-07-30.*
* **ND10** is a small municipal library serving under 5K people, without a certified librarian. The library is open 30 hours a week, M-Sa. Neither the city nor the surrounding county publishes open data, except for one GIS file that can be downloaded from the county. *Website reviewed 2018-07-30.*
* **ND11** is a small Washington State municipal library serving under 5K people, without a certified librarian. Neither the town nor the surrounding county publishes open data. The library is open 21 hours a week, Monday to Thursday. *Website reviewed 2018-07-30.*
* **ND12** is a large county library serving a diverse area of more than 250K people. Both the city and the surrounding county publish extensive open data, and many residents work for technology companies. The area also includes many colleges and universities, and a Code for America chapter. *Response by email on 2018-08-09.*

# Other interviews

* **AR**: AR1, AR2 and AR3 are senior Washington State Archives staff members who administer a local records management grantmaking program. *Interview on 2018-08-02.*