Chicago and New York City’s Use of Open Budget Data
Case study
Aaron Feinstein

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I. Executive Summary

In the past several years, the three largest local governments in the Chicago-metropolitan area (the City of Chicago, the Chicago Public Schools (CPS), and Cook County) have begun publishing open budget datasets. In that same time, the City of New York (NYC) began publishing open budget data, as well as transactional spending and contract data, through its Checkbook NYC website. Both Chicago and NYC’s open budget data has been lauded by transparency advocates as a best practice among cities in publishing financial data.¹

Impetus for Publication and Description of the Data

For the City of Chicago and Cook County, the publication of open budget data was a way for newly elected chief executives to signal a commitment to transparency in order to demonstrate a break from a history of corruption in local government. For CPS, the decision to publish open budget data was driven by a new budget director. In NYC, a newly elected Comptroller, who wanted to demonstrate his good government credentials likely to help support a run for mayor, developed Checkbook NYC.

The City of Chicago and Cook County both released their open budget data using Socrata² data portals that provide a line-item dataset that is exportable into a variety of machine-readable formats. Both Socrata portals also contain visualization tools that allow users to create charts based on the budget data.

CPS and NYC both developed data tools that aim to produce easily understandable visual representations of financial data to help increase public understanding of each government’s finances. Both applications have built-in charting capabilities that generate pie charts and bar graphs as users navigate through the data. In addition to the charting capabilities, both CPS and NYC’s datasets also allow users to export the underlying data in machine-readable formats.

User Interaction with the Data

To determine what types of analysis are being conducted with these datasets, interviews were conducted with 12 subjects, including government staffers responsible for producing these datasets, analysts at the most prominent budget watchdogs in both NYC and


² Socrata is a popular software for government open data platforms in the US. The Federal government, NYC, and Chicago all use Socrata as their open data platform provider. For more information visit: www.socrata.com
Chicago, a number of reporters that work on budget issues, and several civic technologists that work on repurposing government data.

The main benefit cited by interviewees was that the open budget datasets made it easier for them to access routine budget information (e.g., the size of a department’s budget, spending on individual line-items, etc.) This was a benefit for users both inside and outside government, as the Chief Financial Officer of CPS reported that she frequently uses the open budget dataset herself to access information.

“The fact that the entire budget is online, searchable and exportable in excel format is phenomenal.”

-Researchers at the Chicago Teachers Union

While the external users interviewed thought the publication of these datasets was positive, they generally reported that the datasets have not greatly impacted the analyses being produced on any of the four government budgets. Users cited few examples of the datasets being used to create new analyses of the government budgets or being used to impact advocacy for new laws or regulations.

Both of the civic technologists and several of the reporters saw no benefit to the built-in visualizations included in the CPS and Checkbook NYC datasets. They allowed that it might be useful for less expert users of the data, but they were just interested in access to the underlying data in order to build their own visualizations and analysis from the raw data.

“Having summary data on the side could be nice for the general person, but I think the main focus should be on one big data set in multiple formats.”

-Reporter at Capital New York

Users offered several reasons for the limited re-use of open budget data to date. Users of the NYC and CPS data complained that key financial information was lacking from the open budget data. CPS users additionally wanted performance data (e.g., projections of student enrollment at each school) that would have provided greater context for the school-level

3 There is some evidence from to support that on the Socrata-platform which has visualizations capabilities, few users are using this functionality. See: https://thomaslevine.com/l/socrata-users/
budget data. One informant pointed out that usefulness of open budget data is heavily dependent on “whether the underlying data itself creates transparency. If your budget isn't broken down programmatically for example, or if the budget codes are too generic, than even an electronic version is not very useful.”

**Future Research Opportunities**

The four governments reviewed in this case study publish different types of data with varying levels of detail and included varying fields in their datasets. A future research project could develop a standard list of fields to include in an open budget dataset, the types of data that should be included, and methods to assess the quality of open budget data.

This report only explored how expert users are interacting with open budget data in Chicago and NYC. Future research could target other user groups, such as the general public or consumers of specific services, to conduct representative surveys to obtain more reliable feedback on what data these users most want.
II. Introduction

The goal of this case study is to explore why and how local governments in NYC and Chicago are publishing open budget data and how journalists and civil society organizations are using this information. The goal is to describe in detail the form that open budget data is taking in these cities, why it was published in the first place, and what is being done with the data.

The report is organized as follows: Section 2 details the case study’s methodology. Section 3 provides background on the structure of local government in NYC and Chicago, and Section 4 reviews the impetus for publishing open budget data and delivers a detailed description of the open budget datasets that have been published in each city. Section 5 presents a matrix showing how different types of users demand different types of budget information. Section 6 analyses the benefits and limitations of the published datasets and how users have interacted with the datasets to date. Lastly, Section 7, identifies future research opportunities based on the research presented in this study.
III. Methodology

NYC and Chicago were chosen as subjects because their financial transparency efforts have been lauded by several observers of open budget data, including the U.S Public Interest Research Group, a prominent good government organization.4 Because of the accolades they've received, Chicago and NYC were good subjects to attempt to determine if civic society and the media are using the data to analyze local government in new ways or use the information to advocate for changes to existing laws and regulations.

This case study was based on two primary sources of information: open budget datasets published by governments in Chicago and NYC and interviews with stakeholders involved in the production and consumption of these datasets. A review of the existing budget documents and data being published by local governments in Chicago and NYC was conducted. The open budget datasets identified are shown in the table below:

<table>
<thead>
<tr>
<th>Government</th>
<th>Description and Link to Dataset</th>
</tr>
</thead>
<tbody>
<tr>
<td>City of Chicago</td>
<td>Adopted Budget - Expenditures</td>
</tr>
<tr>
<td></td>
<td>Adopted Budget - Positions and Salaries</td>
</tr>
<tr>
<td></td>
<td>Proposed Budget - Expenditures</td>
</tr>
<tr>
<td></td>
<td>Proposed Budget - Positions and Salaries</td>
</tr>
<tr>
<td>Chicago Public Schools</td>
<td>Interactive Budget Reports</td>
</tr>
<tr>
<td>Cook County</td>
<td>Proposed Budget - Expenditures</td>
</tr>
<tr>
<td></td>
<td>Historical Expenditure Data - 1993 to 2011</td>
</tr>
<tr>
<td>New York City</td>
<td>Checkbook NYC</td>
</tr>
</tbody>
</table>

Once the data was initially analyzed, 12 interviews were conducted with government staff, members of the media, and civic groups to get their feedback on the data being published. The interviewees included government staffers responsible for producing these datasets, analysts at the most prominent civic budget watchdogs in both NYC and

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Chicago, a number of reporters that work on budget issues, and several civic technologists that work on repurposing government data. Appendix B details the interview subjects including their titles, organizations, and how they came to be contacted. Initial interviewees were selected based on the author’s knowledge of the media and civic organizations in Chicago and NYC. Additional interview subjects were then based on referrals from the first set of informants.

Government staff were asked questions relating to the impetus to publish open budget data, the technical challenges of publishing the data, and why certain field and distribution channels were chosen. Members of the media, civic organizations, and the private sector were asked questions relating to how useful the data was in their work, feedback they had provided to the governments on the data, and what improvements they would like to see in future versions of the data. Appendix B details some of the specific questions asked of the interview subjects.

Given the anecdotal nature of interviews, the findings presented below are not as reliable as a statistically significant poll of users in either of these cities. But given the knowledge the interviewees have about budgeting in each city, I’m confident that their opinions are fairly representative of how expert users in both cities regard the datasets that are the subject of the case study.

From 2006 to 2008, I was a budget analyst for the New York City Council, where I directed the Budget Transparency Initiative, which successfully reformed the NYC budget to better present how the City spends its money. From 2008 to 2013, I worked for the Chicago Inspector General’s Office and conducted independent, objective, non-partisan research on the economy, efficiency, and effectiveness of City of Chicago programs including extensive analysis of the City of Chicago budget. I also directed Open Chicago an initiative aimed at forcing the Mayor to publish more data online. Through these roles I interacted with reporters and civic organizations engaged in analyzing government budgets in both cities.
IV. Background on Structure of Local Government in Chicago and NYC

Chicago is the third largest city in the United States (US) with a population of nearly 3 million. Chicago is located within Cook County, the second largest County in the US with a population of 5.2 million that includes Chicago and its inner-ring suburbs. The County and City both provide services to City residents, with the City being responsible for major services such as police, schools, and sanitation and Cook County being responsible for the public hospital system and jail system. Cook County is governed by a chief executive, the County Board President, and a legislative body, the Board of Commissioners, comprised of 17 commissioners.

Within Chicago, local government is broken into seven separate governmental entities, shown in the grey boxes in the chart below.

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The City of Chicago (#1 in the chart) is governed by an executive, the Mayor, and a legislative body, the City Council, composed of 50 legislators. The major services the City of Chicago is responsible for include police, fire protections, garbage disposal, street paving and snow removal, water distribution, and running the City’s two airports.\textsuperscript{10} The six other local governments shown in the chart are governed by chief executives and boards appointed by the Mayor.

NYC is the largest city in the US with a population of 8.5 million.\textsuperscript{11} Unlike Chicago, there is no overlapping County government, and instead virtually all local services are provided by the City.\textsuperscript{12} NYC is governed by an executive, the Mayor, and a legislative body, the City Council, composed of 51 legislators.


V. Description of Open Budget Data in NYC and Chicago

This section reviews the open budget data currently being published in Chicago and NYC. The political context for publishing the data and the major characteristics of each dataset are reviewed.

Chicago

The City of Chicago began producing open budget data in May 2011, when it published the 2011 budget that had been enacted in November 2010.¹³ This publication was a direct result of incoming Mayor Rahm Emanuel’s transition committee (he took office in May 2011), which pledged within 100 days of taking office that “a searchable version of the City budget will be posted on-line.”¹⁴

1. Context for publishing budget data

Before Mayor Emanuel took office, Richard M. Daley had been Chicago’s mayor for 22 years. During his administration there were several high-profile scandals that helped maintain Chicago’s decades-old reputation as one of the US’ most corrupt cities.¹⁵ The Emanuel administration wanted to demonstrate a clean break from this corrupt history by enacting a series of ethical reforms and transparency initiatives. Emanuel’s first acts as mayor were signing several new ethics laws.¹⁶ The release of the City’s open budget data was part of this drive to signal a break from Chicago’s corrupt past.

2. Kind of Data

The budget data released is two separate data files: budget appropriations and budgeted positions and salaries. These two datasets mirror the format of the City’s budget ordinance that is enacted by the City’s legislature and contains an appropriations schedule and a position schedule that details what positions are funded by the personnel appropriations. Below are screenshots of the two data files:

Figure 1 – City of Chicago - Appropriations Data

<table>
<thead>
<tr>
<th>Appropriation Authority Description</th>
<th>Appropriation Account</th>
<th>Appropriation Account Description</th>
<th>2015 Ordinance (Amount $)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office of the Mayor</td>
<td>5</td>
<td>Salaries and Wages - On Payroll</td>
<td>$5,580,857.00</td>
</tr>
<tr>
<td>Office of the Mayor</td>
<td>126</td>
<td>Office Conveniences</td>
<td>$1,000.00</td>
</tr>
<tr>
<td>Office of the Mayor</td>
<td>130</td>
<td>Postage</td>
<td>$5,010.00</td>
</tr>
<tr>
<td>Office of the Mayor</td>
<td>150</td>
<td>Public &amp; Reproductive</td>
<td>$1,000.00</td>
</tr>
<tr>
<td>Office of the Mayor</td>
<td>157</td>
<td>Rental Equipment and Services</td>
<td>$49,650.00</td>
</tr>
<tr>
<td>Office of the Mayor</td>
<td>159</td>
<td>Lease Purchase Agreement</td>
<td>$63,000.00</td>
</tr>
</tbody>
</table>

Figure 2 – City of Chicago - Positions and Salary Data

<table>
<thead>
<tr>
<th>Title Description</th>
<th>Budgeted Unit</th>
<th>Total Budgeted Unit</th>
<th>Position Control</th>
<th>Budgeted Pay Rate</th>
<th>Total Budgeted Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mayor</td>
<td>Annual</td>
<td>1</td>
<td>1</td>
<td>$216,210.00</td>
<td>$216,210.00</td>
</tr>
<tr>
<td>Administrative Assistant</td>
<td>Annual</td>
<td>1</td>
<td>1</td>
<td>$48,996.00</td>
<td>$48,996.00</td>
</tr>
<tr>
<td>Administrative Assistant</td>
<td>Annual</td>
<td>1</td>
<td>1</td>
<td>$55,936.00</td>
<td>$55,936.00</td>
</tr>
<tr>
<td>Administrative Secretary</td>
<td>Annual</td>
<td>1</td>
<td>1</td>
<td>$78,529.00</td>
<td>$78,529.00</td>
</tr>
<tr>
<td>Chief of Staff</td>
<td>Annual</td>
<td>1</td>
<td>1</td>
<td>$174,996.00</td>
<td>$174,996.00</td>
</tr>
</tbody>
</table>

The highlighted line in Figure 1 is the connection between the two datasets. The positions and salaries detailed in Figure 2 are based on the appropriation in the highlighted line in Figure 1.

The major fields in the dataset are:

- Fund – Describes the category of revenue used to fund each line-item.
- Department – Indicates the major organizational unit responsible for the spending.
- Appropriation Authority – Indicates a sub-organizational unit within each department. Closest to programmatic level.

• Appropriation Account – Indicates the category of spending such as salaries or contracts.

See Appendix A for a full list of the fields in the dataset.

3. Format of Data

The datasets are published in an Excel-like format on a City website powered by Socrata software. The software allows users to filter and summarize data within the website and save filtered or summarized views. Users can also create graphs and charts based on the data. It allows users to export the data into the following formats: CSV, CSV for Excel, PDF, RDF, RSS, Excel, and XML.

4. Frequency of Update

The data is typically updated only twice per year: once in October, when the Mayor introduces the Mayor’s proposed budget to the City Council and once a final budget is approved by the City Council before the end of the calendar year, which is also the City of Chicago’s fiscal year.

5. Distribution channels

The primary distribution channel is on the City’s Open Data Portal and links to the datasets are provided on the City’s budget office’s website.

6. Feedback to improve data

Socrata’s data portal is capable of accepting comments but this feature has not been enabled for the City of Chicago’s data portal.

7. Demand for new, updated data

The Civic Federation, Chicago's most prominent civic organization devoted to analyzing government finances, provided initial feedback that the City should also post detailed

\[\text{Socrata is a popular software for government open data platforms in the US. The Federal government, NYC, and Chicago all use Socrata as their open data platform provider. For more information visit: www.socrata.com}\]
revenue data. That feedback has not yet been incorporated and the datasets are largely unchanged since their initial publication.

8. Impact on local laws and regulations

To date, there has been no direct impact on City laws due to the publication of open budget data.

Cook County

Cook County first produced open budget data as the result of a project of one of its legislators, Commissioner John Fritchey. The Commissioner and his staff worked with two developers, Derek Eder and Nick Rougeux, to produce Look at Cook, a website that enables users to visualize historic data on Cook County spending. Look at Cook was first published in August 2011 and the data underlying the visualization was posted to the County’s data portal.

Two months later, Cook County Board President Toni Preckwinkle, who took office in December 2010, proposed her second budget to the Board and released the proposed budget in an open data format. A key difference in this data compared to the data provided by Look at Cook was that it was much more granular. In the Look at Cook data, the spending data encompassed 164 rows, while in the 2012 proposed budget dataset there were 5,042 rows.

1. Context for publishing data

Chicago’s long-standing reputation for corruption encompasses the government of Cook County as Chicago is the largest city in the County and the same political party has dominated both governments for most of the last century. In recent history, the administration prior to Board President Preckwinkle’s had two of its top staff members

indicted for corruption. When Preckwinkle announced the creation of the County’s open data portal, she described the data portal as combating “the historic lack of transparency and accountability [that] has eroded the legitimacy of Cook County government in many residents’ eyes.”

2. Kind of Data

The datasets provide several different types of expenditure information including the current year appropriation, the current year-to-date expenditures, and the proposed budget for the following year. Below is a partial screen shot of the dataset.

Figure 3- Cook County Budget Data

3. Format of Data

Like the City of Chicago data, the datasets are published in an Excel-like format on a County website powered by Socrata software. The same filtering, summarizing, and visualization tools are enabled on the County’s data portal. And users can export data in the same file formats.

The major fields in the dataset are:

- GenFundType – Describe the category of revenue used to fund each line-item.
- Bureau – Indicates the major organizational unit responsible for the spending.

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• Object Classification – Indicates the category of spending such as salaries or contracts.

See Appendix A for a full list of the fields in the dataset.

4. **Frequency of Update**

The budget data is updated only once per year, when the proposed budget is released, typically in October. However, this has not been consistent as the budget data was released in 2011, 2012, and 2014, but not in 2013.

5. **Distribution channels**

The primary distribution channel is on the County’s Open Data Portal.

6. **Feedback to improve data**

Socrata’s data portal is capable of accepting comments but this feature has not been enabled for the County’s data portal.

7. **Demand for new, updated data**

The Civic Federation provided feedback requesting that the County publish historical data to allow for better trend analysis, which the County then published. 

8. **Impact on local laws and regulations**

To date, there has been no direct impact on County laws due to the publication of open budget data.

**Chicago Public Schools**

The Chicago Public Schools (CPS) began publishing open budget data in 2012.

1. **Context for publishing data**

The impetus for publishing this data was led by CPS’s budget director (currently Chief Financial Officer), Ginger Ostro. Ostro believed that the traditional PDF version of the

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24 Interview with Sarah Wetmore, Vice President, Civic Federation, February 1, 2015.
budget was limiting and wanted to provided ways to better access and visualize the data. She cited her experience in higher education, where the industry norm is to provide more data in interactive formats.  

2. Kind of Data

The data provided by CPS contains information on expenditures, revenues, and positions. It also provides this information both at a department level and a school level and by fund.

The major fields in the dataset are:

- Unit – Describes spending by organizational category. Describes administrative offices such as the Chief Financial Officer and individual schools.
- Fund Grant – Describes the category of revenue used to fund each line-item.
- Program – Within each Unit, describes spending by program.
- Account – Indicates the category of spending such as salaries or contracts.

See Appendix A for a full list of the fields in the dataset.

3. Format of Data

The data is provided through an Oracle interface shown in the screenshot below. The interface provides several tabs that guide users to different types of information. There are several built-in visualization tools as also shown in the screenshot below. The download data tab allows users to download an Excel or text file that provides all the data being presented through the different tabs. Oracle was chosen as the platform to provide the data because it was already being used internally.  

26 Interview with Ginger Ostro, Chief Financial Officer, Chicago Public Schools, February 4, 2015.
27 Interview with Ginger Ostro, Chief Financial Officer, Chicago Public Schools, February 4, 2015.
4. Frequency of Update

The data is updated annually at the beginning of its budget process. New websites are created for each year’s budget.

5. Distribution channels

CPS releases the data on its website.

6. Feedback to improve data

During one year, CPS amended the budget and updated the numbers on the website. The Teachers’ Union complained that this update was made without any indication that the data had been updated, so CPS added a note to the data indicating that it had been amended. After the initial publication, the Civic Federation asked CPS to include historical data in the interactive reports, which it did in future versions.28

28 Interview with Ginger Ostro, Chief Financial Officer, Chicago Public Schools, February 4, 2015.
7. Demand for new, updated data

In 2015, CPS added the ability to download the complete dataset that powers the interactive reports. Prior to CPS’s creation of the interactive reports, some education reporters in the City would request\(^29\) this data file, which they referred to as the “Oracle Budget” and use it in their reporting on CPS’s budget.\(^30\)

8. Impact on local laws and regulations

To date, there has been no direct impact on CPS laws due to the publication of open budget data.

New York City

In July 2010, NYC’s Comptroller John Liu published Checkbook NYC, which initially included only financial transactions.\(^31\) Budget data was added in Checkbook NYC 2.0, which launched in January 2013.

1. Context for publishing data

The Comptroller’s office is a powerful, independently elected office in the City that provides “comprehensive oversight of the City’s budget and fiscal condition”.\(^32\) But the Comptroller does not make budget decisions, which are made by the Mayor and City Council. Thus, there was little risk in any analysis of data reflecting negatively on the Comptroller.

Additionally, Comptroller Liu took office only a few months before Checkbook NYC was launched. Liu later admitted that he wanted to be Mayor as soon as he became

\(^29\) Government data in Illinois can be requested through the Freedom of Information Act (FOIA), which is a law that enables members of the public to request and obtain most data maintained by governments. Only private and confidential data is exempted from disclosure.

\(^30\) Interview with Sarah Karp, Education Reporter, Catalyst Chicago, February 18, 2015.


Comptroller (he ran in September 2013 and lost) and Checkbook NYC raised his profile in good government circles.  

2. Kind of Data

Checkbook NYC is a detailed dataset that presents information on the City’s budget, actual spending, personnel, and contracts.

The major fields in the budget dataset are:

- Agency – Indicates the major organizational unit responsible for the spending. Similar to cabinet level in a federal government.
- Department – Indicates a sub-organizational unit within each department that is the level at which the budget is appropriated by the City Council.
- Budget Name – Lowest level of spending within each department. Closest to programmatic level.
- Expense Category – Indicates the category of spending such as salaries or contracts.

See Appendix A for a full list of the fields in the dataset.

3. Format of Data

Similar to the CPS data, the dataset is provided through a web-based application that emphasizes producing dynamic visualizations of spending data. Checkbook NYC presents information in a dashboard format with the underlying data also presented, but less prominent. Here is a screenshot of the dashboard features on its landing page:

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The data is exportable in a CSV or XML format and Checkbook NYC also provides an Application Programming Interface (API). APIs allow users “to automatically search, retrieve or submit information directly from databases online.” APIs are especially important for developers looking to reuse open data because they “reduce development complexity and ensure that the data used by developers is always up to date.”

4. Frequency of Update

The spending data is updated daily, which sets it apart from the other datasets reviewed in this case and from other checkbook-style transparency sites employed by other governments in the US. The budget data is updated after the budget is adopted each

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year. This too sets it apart from the Chicago-area datasets that all provide proposed budget data.

5. Distribution channels

The distribution channel is the Comptroller’s website. When it was initially launched and when significant updates are made the Comptroller issues press releases to inform the media and public.

6. Feedback to improve data

Three years after it was launched, Checkbook NYC made the code that powers the website open source. Socrata partnered with the Comptroller’s office to launch a checkbook application based on Checkbook NYC.37

7. Demand for new, updated data

Budget data was not part of the initial release but was added in 2013. Additional spending data on economic development programs has also been added since the initial launch.

8. Impact on local laws and regulations

To date, there has been no direct impact on City laws due to the publication of open budget data.

VI. Comparison of Different Types of Users and What They Demand from Budget Data

Different groups of users of open budget data interact with the data in different ways. Based on the interviews conducted and reviews of the datasets, the chart below details the different demands of several user groups and the different ways they interact with budget data.
## Figure 6 – Comparisons of User Demands of Open Budget Data

<table>
<thead>
<tr>
<th>User Groups</th>
<th>Specific Data Demands</th>
<th>Examples of Response to the Demand</th>
<th>Implications of Using the Data</th>
<th>Potential and Actual Outcomes of the Data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Expert Users</strong> (Financial watchdogs, Advocacy organization, Journalists, Civic Technologists)</td>
<td>• Access to complete budget dataset in machine-readable format or thru API&lt;br&gt;• Trend analysis, continuity with prior year data and previous budget publications</td>
<td>• All datasets released provide access to API or exportable data&lt;br&gt;• CPS added data to increase continuity with previous budget publications</td>
<td>• Interested in creating analyses and visualizations for a wider audience&lt;br&gt;• Ensure that exports of data are the appropriate versions</td>
<td>• Develop new applications based on the data (Contract Tracker in NYC, Look at Cook for Cook County)&lt;br&gt;• Faster integration of data into traditional budget analysis</td>
</tr>
<tr>
<td><strong>Internal Government Audiences</strong></td>
<td>• Want information quicker than in underlying database</td>
<td>• None of the governments studied released the data with this group of users necessarily in mind</td>
<td>• Can lead to more frequent updating and more rapid improvement if internal users are relying on the information for government decision-making</td>
<td>• More easily access information&lt;br&gt;• Allow non-budget experts within the organization to have greater access to the data</td>
</tr>
<tr>
<td><strong>Consumers of government services (i.e., parents)</strong></td>
<td>• Specific information on the service they are consuming, such as school-level data for parents</td>
<td>• CPS releases information at school level and provides filtering tools to quickly drill-down to specific schools</td>
<td>• Data needs to be well defined, so non-expert user can easy find and digest information</td>
<td>• Compare resources of schools in different neighborhoods within a city</td>
</tr>
<tr>
<td><strong>General Public</strong></td>
<td>• General information, such as spending by major department or total tax burden</td>
<td>• NYC and CPS created tools focused on data visualization to make data more accessible</td>
<td>• Data needs to be well defined, so non-expert user can easy find and digest information</td>
<td>• Understand how budget is divided by major service&lt;br&gt;• Understand major sources of revenue</td>
</tr>
</tbody>
</table>
VII. Analysis of the Use of Open Budget Data in NYC and Chicago

This section discusses the benefits and limitations of the datasets that have been published in NYC and Chicago and how users have been interacting with them.

**Open Budget Data Increases Access to Budget Data for All Users**

The ease of using open budget data compared to traditional PDF budgets is substantial. Researchers for the Chicago Teachers Union, a key observer of the CPS budget said that “the fact that the entire budget is online, searchable and exportable in excel format is phenomenal.”³⁸ Even for reporters who had previously requested and received the information, there is a benefit in no longer needing to ask for it.³⁹ This is especially important during the budget process, when the need to analyze the proposed budget is time sensitive. In the budget processes for all the Chicago governments, the proposed budgets are typically released only three to five weeks before the budgets are adopted by the legislatures.

Prior to the development of the interactive website, Look at Cook, users would have had to dig through several paper budgets to obtain trend data on Cook County’s budget. But Look at Cook allows users to view Cook County budget trends over time, and compare actual expenditures to budgeted ones, as seen in the screen shot below:

³⁸ Email from the Chicago Teachers’ Union, February 11, 2015.
³⁹ Interview with Sarah Karp, Education Reporter, Catalyst Chicago, February 18, 2015.
In CPS, where the open budget data was pushed by the agency’s budget director, she commented that she uses the data internally, highlighting that a user-friendly public presentation can be useful to an agency’s internal users.  

1. **Open Budget Data Helps Elected Officials Demonstrate a Commitment to Transparency**

The City of Chicago, Cook County, and Checkbook NYC all published open budget datasets soon after newly elected officials took office.  

The City of Chicago and Cook County published open budget data at least in part to demonstrate a break from a history of corruption in local government. In NYC, the Comptroller created Checkbook NYC as he had his sights set on becoming mayor. For CPS, the decision to publish open budget data was driven by a new budget director. One observer pointed out that the changing of administrations is an optimal time to increase transparency for the

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40 Interview with Ginger Ostro, Chief Financial Officer, Chicago Public Schools, February 4, 2015.
41 While the City of Chicago and CPS have begun to publish open budget data, several other agencies controlled by the Mayor of Chicago have not yet published any datasets. Of the seven agencies controlled by the Mayor, the City of Chicago and CPS are by far the most scrutinized by the media and civic society, so this may partially explain why these are the agencies publishing open budget data and the others are not. Because of less scrutiny being applied to these agencies, there is less of a priority for the Mayor to direct them to publish open budget data and the actors inside them do not perceive there to be a demand for this information.

www.fiscaltransparency.net
incoming elected officials, because any problems identified by the data’s release can be blamed on the prior administration.\(^\text{42}\)

2. Existing Budget Documents and Software Heavily Influence How Open Budget Data is Published

For the governments reviewed, the data that is published is heavily influenced by the existing budget documents and the underlying financial system that the government uses. Both the City of Chicago and Cook County publish Excel-like versions of budget documents that they have published for several years. CPS publishes a more granular version using a module built into its financial system. In this case, the government where a budget staffer was the driving force behind publishing the data has the most detailed presentation, enabling the most in-depth analysis. This may be because the budget staffer uses the reports in her own work as well.\(^\text{43}\) But it appears to also be because the underlying financial system enables more detailed analysis. CPS’s data is based on a dataset, referred to as the “Oracle Budget,” that has been released to reporters for years and is more granular than the datasets of the City of Chicago and Cook County.

Thus, the usefulness of the open budget datasets reviewed is tied to how useful the underlying budget structure is. As one NYC interviewee noted, the usefulness of open budget data is heavily dependent on “whether the underlying data itself creates transparency. If your budget isn’t broken down programmatically for example, or if the budget codes are too generic, than even an electronic version is not very useful.”\(^\text{44}\)

For example, the City of Chicago reports spending on police patrols at the citywide level without any breakdown of spending or personnel at any smaller geography, which is a key piece of information for legislators and residents who want to examine how police resources are allocated across the city. Similarly, in NYC, spending on childcare is only shown at a citywide level. By contrast, CPS provided individual school level spending and personnel detail, which was lauded by users of the data.

\(^{42}\) Interview with Derek Eder, Principal, Datamade, February 1, 2015.
\(^{43}\) Interview with Ginger Ostro, Chief Financial Officer, Chicago Public Schools, February 4, 2015.
\(^{44}\) Email from Brendan Cheney, Reporter, Capital New York, April 4, 2015.
3. Users Do Not Feel that the Data is Complete

Most of the users feel that the data being published is not complete. A common complaint was the need for more actual spending data and amended budget data as budget modifications occur during a fiscal year. There was also a desire for data measuring the demand for a given service (such as projected school enrollment in the case of CPS’s budget) as an important way to analyze whether the resource allocation is fair or meeting demand.

Consumers of the data also raised the issue of whether the datasets provided all the useful information contained in the underlying database. For the CPS data, even though it was the most detailed of the datasets reviewed, a user wanted the “ability to query the underlying database,” rather than only see pre-determined queries developed by the government publishing the data.\(^4\)\(^5\) And the fact that spending within charter schools\(^4\)\(^6\) was not available was a major complaint of one of the users.\(^4\)\(^7\)

In NYC, Checkbook NYC only provides budget data after the budget process is completed. This means it does not provide any data that can help users analyze the budget before decisions have been made and the budget has been adopted. This lack of ex-ante transparency is the reason one interviewee does not use Checkbook NYC.\(^4\)\(^8\) The Comptroller’s office, which is not involved in the budget proposal and adoption process, produces Checkbook NYC. The key budget documents that users wanted access to in a machine-readable format are under the control of the Mayor’s budget office.

Additionally, the budget structure in Checkbook NYC is slightly different from the budget structure in the budget documents published by the mayor’s office.\(^4\)\(^9\) Finally, two users found it difficult to get bulk data out of Checkbook NYC.\(^5\)\(^0\) However, one of the users

\(^{45}\) Interview with Linda Lutton, Education Reporter, WBEZ, February 27, 2015.
\(^{46}\) “a school that is established by a charter, is run by teachers, parents, etc., and uses tax money but does not have to be run according to the rules of a city or state” http://www.merriam-webster.com/dictionary/charter%20school
\(^{48}\) Interview with Ben Wellington, April 2, 2015.
\(^{49}\) Email with Chris Whong, April 15, 2015.
\(^{50}\) Email with Chris Whong, April 15, 2015. Email from Brendan Cheney, Reporter, Capital New York, April 4, 2015.
was able to extract enough data out of Checkbook NYC to produce a high-level visualization of the NYC budget.\footnote{Chris Whong, New York City Budget Visualization, June 13, 2013, accessed May 21, 2015, \url{http://www.chriswhong.com/projects/nycbudget/}.

4. Open Budget Data May Increase the Chance of Data Being Misinterpreted

A concern of both producers and consumers of the data was that with more information available, users have taken information out of context and made incorrect conclusions about budget data. CPS has seen users misinterpret the data.\footnote{Interview with Ginger Ostro, Chief Financial Officer, Chicago Public Schools, February 4, 2015.} Likewise, an education reporter has seen parents and others who testify at CPS’s public hearings use the data incorrectly.\footnote{Interview with Sarah Karp, Education Reporter, Catalyst Chicago, February 18, 2015.}

A related concern for CPS was how to represent spending that was controlled by central offices (e.g., building engineers, janitors) that operate at individual schools. If the spending is presented at schools it looks like Principals (the administrators in charge of individual schools) have control over more money than they actually do, but if it is categorized as district-wide spending, then it looks like less money is being spent at schools than is actually the case.\footnote{Interview with Ginger Ostro, Chief Financial Officer, Chicago Public Schools, February 4, 2015.}

Several interviewees (both producers and consumers) expressed a need for more training of how to use the datasets to combat misinterpretation and as way to encourage additional users to be more engaged with the data. Some specific suggestions included having governments dedicate staff to answering data questions via phone or email, providing training to community organizations, and creating data dictionaries built into the datasets.

5. Website Reliability and Speed Are Important to Users

Multiple users of CPS’s interactive reports complained about the website being slow or unreliable.\footnote{Email from the Chicago Teachers’ Union, February 11, 2015. Interview with Linda Lutton, Education Reporter, WBEZ, February 27, 2015.} It was also noted that the website is optimized for Internet Explorer and

\footnote{Interview with Ginger Ostro, Chief Financial Officer, Chicago Public Schools, February 4, 2015.}
does not work in some other web browsers.⁵⁶ These complaints illustrate that the reliability, speed, and accessibility of the website hosting open budget data can negatively impact the user experience, regardless of the quality of the data or application being used to present data.


In both the Chicago-area governments and NYC, there is not a tradition of significant amendment to government budgets making the budget process less of a focal point of government policymaking than it is elsewhere.⁵⁷ This may help explain why the release of these datasets has not unleashed more new publications or applications in Chicago and NYC. With little hope of impacting the budget process, civic organizations and the media concentrate their efforts elsewhere. One NYC interviewee believes the mayor's office has not published more exhaustive open budget data because they do not believe that enough users are interested in the data.⁵⁸

This lack of customer base may help explain why there appears to be more interest in the data immediately after publication, but then diminishing interest in following years. The chart below shows a sharp decline in views for the City of Chicago and Cook County’s open budget datasets since the datasets were first produced.

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⁵⁶ Email from the Chicago Teachers’ Union, February 11, 2015.
⁵⁷ The best evidence for this are the minimal revisions made to the budgets proposed by the executives in each City.
⁵⁸ Interview with Maria Doulis, Director of City Studies, Citizen Budget Commission, April 16, 2015.
Figure 8 – Page Views of the City of Chicago and Cook County Datasets Since Publication

* Initial publication of City of Chicago data

** Initial publication of Cook County data

*** Cook County did not publish a dataset in 2014

Source: Socrata City of Chicago and Cook County Open Data Portals
VIII. Future Areas of Research

The open budget data that has been published in Chicago-area and NYC governments has increased access to budget information but has not yet significantly impacted how expert users interact with budget data or impacted local laws or regulations. This section details additional research that may expand our understanding of how users are interacting with open data and how we can make open budget data more impactful.

Create a Standard Open Budget Data Format

The four governments reviewed in this case study publish different types of data with varying levels of detail and include varying fields in their datasets. A future research project could develop a standard list of fields, a standard checklist of types of data to include in a publication, and standard methods to assess the quality of open budget data.

One benefit of standardization is that it would allow easier comparison between subnational units of government. Additionally, standardization would allow residents, the media, and civic organizations to aggregate budget data from different governments within the same metropolitan area to gain a full picture of the government services being provided. This would, in turn, also allow greater comparisons between metropolitan areas that have different government structures.

To develop a standard list of data fields for an open budget dataset, researchers could look to the International Monetary Fund and United Nations, which have both developed expenditure classifications systems.\(^{59}\) Based on the Chicago and NYC datasets, a simple standard could include:

- Fund – Describing the types of revenue
- Cabinet level agency or department – Describing the major organizational unit responsible for the spending
- Hierarchy 1 – Describe spending at a programmatic level within a cabinet level
- Hierarchy 2 – Describe spending at a more granular level than Hierarchy 1
- Hierarchy 3 – Describe spending at a more granular level than Hierarchy 2

• General expenditure category – Indicate different types of spending such as salaries or contracts.

The research could explore the need for different standard fields for different types of services: a different standard for a school budget than for a police department budget for example.

In order to provide guidance to governments about what data users most want a checklist could be developed to identify the types of information that should be included in an open budget dataset. A potential checklist could include:

• Prior Year Expenditures
• Proposed Appropriations
• Amended Appropriations
• Position Information
• Contractual Information
• Revenue Data
• Key Performance Indicators
• Annual Reports and Financial Statements by Department/Agency
• Audit Reports
• Program Evaluations

In reviewing these different datasets from four jurisdictions, certain datasets are more useful than others. To move beyond simply crediting governments for publishing open budget data, we should develop ways to measure the quality or usefulness of the data being published. A standard quality assessment of open budget data should include targets for website reliability and speed that open budget data websites should strive for. Several metrics should be tracked and published regarding the use and accessibility of open budget data including:

• Website visits
• Page views within datasets
• Average time on page
• Website availability
• Speed of query execution

To further assess quality, an important metric may be assessing the granularity of a budget dataset. One way to do this would be using the average
appropriation/expenditure per row of data. For spending that was dispersed geographically a metric could be the average amount per geographical unit. The chart below calculates the average appropriation by row within the Chicago-area and NYC datasets reviewed in this study.

Figure 9 – Average Appropriation by Row in Each Dataset

Solicit Feedback from More General User Groups

This case study has only dealt with how expert users are interacting with open budget data in Chicago and NYC. While the expert users speculated on how other user groups, such as consumers of government services and the general public, may be using the data, this report does not provide any comprehensive insight into the needs of these other user groups.

Future research could target these user groups. For consumers of government services, a potential project could engage users at the point when they consume a government service. For example, as parents enroll their children in a school, researchers could administer a survey to a representative sample of parents to determine if they are using
open budget data to help inform their decisions about what school to send their children or how they advocate for services.

To get feedback from the general public, future research could survey the public about the usefulness of open budget data. In the US, several major cities use Citizen Satisfaction Surveys to get statistically representative feedback on the performance of government services. For local governments already using these surveys, questions could be added to solicit the general public’s feedback on open budget data.

Research What Built In Visualizations and Analytical Tools Are Most Useful to Users

CPS and NYC both built applications with built-in visualizations to try and make budget data more accessible to the non-expert users. Future research could explore which built-in visualizations best accomplish this goal. Many websites engage in extensive A/B testing to determine if slight variations in page layout and graphics improve the user experience. Using similar methods, researchers could test different visualizations, formats, mouseover, and other aspects of open budget datasets to determine which elements are most useful.

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60 See this compilation of Citizen Satisfaction Surveys in North Carolina, US. [http://www.sog.unc.edu/node/522](http://www.sog.unc.edu/node/522)

IX. Appendix A – List of Fields in Each Dataset

The table below lists the fields in each of the datasets reviewed in the case. This shows the fields in the expenditure/budget section of each dataset. Additional fields exist in the personnel and contract sections of the datasets (where applicable).

<table>
<thead>
<tr>
<th>City of Chicago - Appropriations</th>
<th>Chicago Public Schools</th>
<th>Cook County</th>
<th>NYC - Expenditures</th>
</tr>
</thead>
<tbody>
<tr>
<td>FUND TYPE</td>
<td>Unit</td>
<td>FundType</td>
<td>Accrued Expense</td>
</tr>
<tr>
<td>FUND CODE</td>
<td>Unit Name</td>
<td>GenFundType</td>
<td>Adopted</td>
</tr>
<tr>
<td>FUND DESCRIPTION</td>
<td>Fund Grant</td>
<td>Bureau</td>
<td>Agency</td>
</tr>
<tr>
<td>DEPARTMENT NUMBER</td>
<td>Fund Grant Name</td>
<td>Department Number</td>
<td>Budget Code</td>
</tr>
<tr>
<td>DEPARTMENT DESCRIPTION</td>
<td>Program</td>
<td>Department Title</td>
<td>Budget Name</td>
</tr>
<tr>
<td>APPROPRIATION AUTHORITY</td>
<td>Program Name</td>
<td>Object Classification</td>
<td>Cash Expense</td>
</tr>
<tr>
<td>APPROPRIATION AUTHORITY DESCRIPTION</td>
<td>Account</td>
<td>Account</td>
<td>Department</td>
</tr>
<tr>
<td>APPROPRIATION ACCOUNT</td>
<td>Account Name</td>
<td>Object Account</td>
<td>Encumbered</td>
</tr>
<tr>
<td>APPROPRIATION ACCOUNT DESCRIPTION</td>
<td>FY14 Adopted Budget</td>
<td>Description</td>
<td>Expense Category</td>
</tr>
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<td>2015 ORDINANCE (AMOUNT $)</td>
<td>FY14 Expenditures</td>
<td>FY2014 Adopted Appropriation</td>
<td>Modified</td>
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<tr>
<td></td>
<td>FY14 Expenditures</td>
<td>FY2014 Adjusted Appropriation</td>
<td>Post Adjustments</td>
</tr>
<tr>
<td></td>
<td>FY15 Proposed Budget</td>
<td>FY2015 Department Request</td>
<td>Pre-Encumbered</td>
</tr>
<tr>
<td></td>
<td>FY14 Budgeted Positions</td>
<td>FY2015 President's Recommendation</td>
<td>Year</td>
</tr>
<tr>
<td></td>
<td>FY14 Ending Positions</td>
<td>FY2015 Approved &amp; Adopted Budget</td>
<td></td>
</tr>
<tr>
<td></td>
<td>FY15 Proposed Positions</td>
<td>FY2014 Expenditures as of 09/30/2014</td>
<td></td>
</tr>
<tr>
<td></td>
<td>FY15 Proposed Positions</td>
<td>FY2014 Build Date</td>
<td></td>
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X. Appendix B – Interview Subjects and Questions

The table below details the titles and organizations of the interview subjects and how they were identified as an informant.

<table>
<thead>
<tr>
<th>Title</th>
<th>Organization</th>
<th>Category</th>
<th>City</th>
<th>Why Contacted</th>
<th>How Contacted</th>
</tr>
</thead>
<tbody>
<tr>
<td>VP and Research Director</td>
<td>Civic Federation</td>
<td>Civic</td>
<td>Chicago</td>
<td>Prominent civic organization devoted to budget issues</td>
<td>Direct Contact</td>
</tr>
<tr>
<td>Principal</td>
<td>Datamade Chicago</td>
<td>Private</td>
<td>Chicago</td>
<td>Prominent civic hacker Developed “Look at Cook”</td>
<td>Direct Contact</td>
</tr>
<tr>
<td>Policy Analyst</td>
<td>Chicago Teachers Union</td>
<td>Civic</td>
<td>Chicago</td>
<td>Analyze CPS budget</td>
<td>Direct Contact</td>
</tr>
<tr>
<td>Policy Analyst</td>
<td>Access Living</td>
<td>Civic</td>
<td>Chicago</td>
<td>Publish an annual analysis of the CPS budget</td>
<td>Referral</td>
</tr>
<tr>
<td>Chief Financial Officer</td>
<td>Chicago Public Schools</td>
<td>Government</td>
<td>Chicago</td>
<td>Responsible for publishing open budget data</td>
<td>Direct Contact</td>
</tr>
<tr>
<td>Budget Analyst</td>
<td>Cook County</td>
<td>Government</td>
<td>Chicago</td>
<td>Responsible for publishing open budget data</td>
<td>Direct Contact</td>
</tr>
<tr>
<td>Title</td>
<td>Organization</td>
<td>Category</td>
<td>City</td>
<td>Why Contacted</td>
<td>How Contacted</td>
</tr>
<tr>
<td>---------------</td>
<td>------------------</td>
<td>----------</td>
<td>-------------</td>
<td>-----------------------------------------------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Reporter</td>
<td>Catalyst</td>
<td>Media</td>
<td>Chicago</td>
<td>Does in-depth reporting on CPS</td>
<td>Direct Contact</td>
</tr>
<tr>
<td>Reporter</td>
<td>WBEZ</td>
<td>Media</td>
<td>Chicago</td>
<td>Does in-depth reporting on CPS</td>
<td>Direct Contact</td>
</tr>
<tr>
<td>Reporter</td>
<td>Capital NY</td>
<td>Media</td>
<td>New York</td>
<td>Reporter, previously government budget analyst</td>
<td>Direct Contact</td>
</tr>
<tr>
<td>Professor</td>
<td>Pratt Institute</td>
<td>Civic</td>
<td>New York</td>
<td>Prominent civic technologist</td>
<td>Direct Contact</td>
</tr>
<tr>
<td>Director of City Studies</td>
<td>Citizens' Budget Commission</td>
<td>Civic</td>
<td>New York</td>
<td>civic organization devoted to budget issues</td>
<td>Direct Contact</td>
</tr>
<tr>
<td>NA</td>
<td>Self</td>
<td>Civic</td>
<td>New York</td>
<td>Prominent civic technologist</td>
<td>Referral</td>
</tr>
</tbody>
</table>

This is the list of questions that were asked to each interview subject.

1. What were the initial reasons behind publishing the data?
2. How was the data and the format chosen? (asked of government officials publishing the data)
3. What new features/improvements are planned for future iterations of the dataset/application? (asked of government officials publishing the data)
4. What has the release of this data enabled civic organizations and the media to do that they couldn't do before?
5. What are some of the problems/limitations in what has been published so far?
6. What improvements would you suggest?
## XI. Appendix C – Major Characteristics of Open Budget Datasets

<table>
<thead>
<tr>
<th></th>
<th>City of Chicago</th>
<th>Chicago Public Schools</th>
<th>Cook County, IL</th>
<th>City of New York</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Kind of Data</strong></td>
<td>Proposed and Approved Budget – Appropriations and Positions</td>
<td>Proposed and Approved Budget – Appropriations, Positions, and Revenue</td>
<td>Proposed Budget - Appropriations</td>
<td>Approved Budget, Expenditures, Positions, Contracts, and Revenue</td>
</tr>
<tr>
<td><strong>Format of Data</strong></td>
<td>Socrata Web Application</td>
<td>Oracle Web Application</td>
<td>Socrata Web Application</td>
<td>Custom Open Source Web Application, later adopted by Socrata</td>
</tr>
<tr>
<td><strong>Frequency of Update</strong></td>
<td>Annually, during budget process</td>
<td>Annually, during budget process</td>
<td>Annually, during budget process</td>
<td>Daily for Checkbook data, Post budget adoption for budget data and then quarterly</td>
</tr>
<tr>
<td><strong>Distribution Channels</strong></td>
<td>Data Portal</td>
<td>Budget Website</td>
<td>Data Portal</td>
<td>Comptroller Website</td>
</tr>
<tr>
<td><strong>Feedback to Improve Data</strong></td>
<td>Limited</td>
<td>Some</td>
<td>Limited</td>
<td>Some</td>
</tr>
<tr>
<td><strong>Demand for new, updated data</strong></td>
<td>Limited</td>
<td>Type of data available and functionality has expanded</td>
<td>Limited</td>
<td>Type of data available and functionality has expanded</td>
</tr>
<tr>
<td>Impact on local laws and regulations</td>
<td>City of Chicago</td>
<td>Chicago Public Schools</td>
<td>Cook County, IL</td>
<td>City of New York</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>-----------------</td>
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<td>----------------</td>
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<table>
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<th>City of New York</th>
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<tr>
<td>Adopted Budget - Expenditures</td>
<td>Interactive Budget Reports</td>
<td>Proposed Budget - Expenditures</td>
<td>Checkbook NYC</td>
<td></td>
</tr>
</tbody>
</table>