Testimony of the New York City Independent Budget Office
On Open Source and Collaborative Software Purchasing
To the New York City Council Committee on Contracts
February 23, 2016

Good morning Chair Rosenthal and members of the committee. I am Doug Turetsky, chief of staff and communications director for the city's Independent Budget Office. Thank you for the opportunity to speak today about the Council's efforts to reduce city spending on software, which totaled roughly $80 million last year, through the use of open-source software or by joining with other jurisdictions in bulk purchases of licensed products.

Since open-source software has little or no initial procurement cost, favoring this no-cost source over licensed software has the greatest long-term savings potential. For a number of years, IBO's _Budget Options_ volume has included an analysis of the savings the city might realize in moving in this direction.

In our most recent edition, published in December 2015, we took a look at one of the city's biggest software expenditures: the Microsoft licensing agreement. In 2015, the city spent $25 million to maintain Microsoft licenses—an amount roughly equal to the combined budgets of all five Borough Presidents.

Replacing the Microsoft programs with free open-source programs would initially require some investment on the city's part, both in hiring developers to create and install new versions to replace customized applications and macros that agencies have built on top of Microsoft's operating systems and applications, as well as for staff training. But over several years there is potential for the savings to grow to the full $25 million cost of using Microsoft systems. IBO estimated initial savings of $8 million in the first year of using open-source alternatives to Microsoft programs.

Microsoft software is of course not the only software city agencies license, and many open-source software alternatives exist for these other programs. For example, many city agencies, including IBO, have individual licenses for statistical software such as SAS. IBO currently spends about $25,000 annually for SAS licenses. Multiply this amount by the numerous—and generally bigger—city agencies that also use SAS or similar statistical programs and the dollars spent are not insignificant. While there are upfront costs in training and converting data in existing programs, if 10 agencies switched from commercial software to open-source programs such as R for statistical analysis, the city could end up achieving considerable savings over time.

Some software users are reluctant to use open-source programs for reasons beyond retooling and data conversion. These concerns generally center on lack of access to technical support. Intro 365's focus on bulk purchases of software products, including with other governmental entities, is another way to reduce city outlays on computer programs.

The city already has experience with bulk software purchasing for commercial software. Our current arrangement with Microsoft is the result of just this kind of effort. In October 2010, the Bloomberg Administration entered into a so-called enterprise licensing agreement with Microsoft. Under this agreement, the city consolidated its agency-by-agency purchases of a variety of Microsoft products under a single citywide contract. At the time, it was estimated the city would save $50 million over five years. If there are barriers to shifting to open source, there are likely other sorts of applications such as statistical analysis, desktop GIS, and web design and layout, where bulk purchasing also has the potential to lower spending on commercial software.

Beyond the goal of reducing city spending, the legislation under consideration today has other notable features. The reporting requirement in Intro 366 will be an important tool in guiding the city through a transition to greater reliance on open-source programs. Detailed information about types of software procured by city agencies and cost savings resulting from the use of open-source software would be a crucial means of evaluating the long-term savings potential of minimizing the use of commercial software.

There are other, harder-to-quantify rationales for decreasing city agencies' use of proprietary software. As noted in the introduction to Intro 366, the use of open-source software is an important step toward ensuring that the city maintains as much control over the continued accessibility of public data as possible and that the public has access to this data without tracking or other requirements or limitations imposed by commercial software companies.

Thank you again for providing us with the opportunity to testify. I would be happy to answer any questions.

Good morning Chairs Rosenthal and members of the Committees on Contracts. My name is Don Sunderland and I am Deputy Commissioner for Application Development Management at the Department of Information Technology and Telecommunications, or DoITT. Thank you for the opportunity to testify today on **Intro. 365**, regarding collaborative software purchasing, and **Intro. 366**, regarding free and Open Source software.

As discussed with members of the Committee, the City of New York agrees with the Council on the concept and intention of Intro. 365 and Intro. 366, and welcomes the opportunity to continue our conversations about how best to achieve their goals. Taking each proposal here in turn:

Intro. 365 would require the Mayor to designate an agency to develop and implement a plan to coordinate with other jurisdictions when purchasing software, and would also require the designated agency to create a website with information regarding software purchased by the City.

The City of New York supports sharing Open Source code among municipalities, and has in fact advanced this idea in a number of ways.

- o The NYC Government Publications portal, which makes agency publications available in digital form online, was developed using Open Source software.
- o The OpenRecords portal, under development to handle Freedom of Information Law requests, utilizes Open Source software originally created by Code for America for the City of Oakland.
- o Former New York City Public Advocate de Blasio utilized the code from the New York State Senate's Blue Bird constituent case management system to build a comparable system on the Open Source CiviCRM platform.

The City also maintains its own dedicated page on GitHub, a web-based repository for code sharing and collaboration. Today, the source code from more than 20 City programs and initiatives, including the aforementioned NYC OpenRecords, is posted on that page, as well as the City's Pre-K Finder, City Record Online, Government Publications Portal, NYC Tech Jobs website, and data feeds from the Department of Transportation and City Hall.

Just last month, the City's popular GeoClient service – a geocoding interface that provides geographic coordinates (latitude and longitude) and other location-based attributes such as City Council and community district, for physical street addresses – was also released under an Open Source license for the first time and posted to GitHub. Geoclient serves as a critical tool for developers creating mapping applications and for in-depth analysis of City data.

While we have embraced the use and sharing of Open Source code where it makes sense to do so – and continue to look for new opportunities to do so – we also have some concerns with the legislation as currently drafted.

As discussed, one of these concerns regards the required used of the Civic Commons portal. Originally a collaboration between Code for America and Open Plans, as of 2015 neither entity is affiliated with Civic Commons – so designating in law a specific platform to serve as the City's Open Source code repository may not be prudent.

Additionally, use of a Civic Commons portal providing access to software purchases for use by other jurisdictions would require proprietary software to be purchased with unlimited licenses for unnamed users, which is not a realistic expectation. Similarly, given the size, scope, and complexity of City operations, a requirement for any code the City has or causes to come into use be open sourced is not attainable.

Moreover, given multiple, complex regulatory frameworks, coordinating a single software purchase among, say, California, Texas, Chicago, and New York City would be exceedingly difficult to navigate. Nor do we know what criteria would define which procurements are to be worked on across different municipalities. And, of course, we could not compel other municipalities beyond our jurisdiction to pursue or participate in collaborative software purchasing.

Finally, at a local level, it is unclear how a single agency could, without additional resources, effectively enforce the requirement that all Open Source code in use across the City is posted.

Still, the aim of the legislation is laudable and one we are committed to continue working toward. Rather than mandating use of a specific code repository platform it would be better, perhaps, to pursue a technology-neutral central repository. And in that repository, agencies, entities, and individuals within and beyond New York City could post, share and collaborate on code across a range of City initiatives. Finally, requiring each agency to contribute to this shared resource as appropriate to its business needs and requirements, rather than requiring one agency to enforce a one-size-fits-all mandate, would be the preferred approach.

Therefore, we look forward to continuing our discussions with the Council regarding Intro. 365.

Intro. 366 would require the City Chief Procurement Officer and the DoITT Commissioner to develop a plan to minimize the amount of proprietary software the City purchases, and increase the amount of free and Open Source software the City purchases.

Like that of Intro. 365, the intent of 366 is one with which we firmly agree. In practice, however, we note that it is not necessarily consistently cheaper to use Open Source software – particularly for enterprise level applications – because the City must still purchase maintenance from a third party to address issues with the software once it is in production.

Still, long-term the trend is clear – and the trend for enterprise software is toward the increased use of Open Source. According to a recent study by Gartner, by 2018 more than 70% of new in-house applications will be developed on Open Source relational databases, and 50% of existing commercial database instances will have been converted or be in the process of converting. Among the reasons for this trend is that maintaining flexibility helps address vendor "lock-in" and allows municipalities to retain leverage in negotiations with software vendors. And the competition inherent in Open Source technology can also drive down the cost of software licenses.

New York City is adapting accordingly. DoITT promotes the use of Open Source technology as appropriate and beneficial for the City – and where security, scalability, and maintenance considerations can be met. As previously mentioned, we leverage GitHub as a repository for contributing Open Source projects for use by other City agencies, municipalities, and civic groups/civic technologists.

Today, DoITT currently uses Open Source application platforms such as:

- o LINUX
- o OpenGeo – an application framework for PlowNYC and PKA Pre-K finder
- o Drupal – a content management system (NotifyNYC, NYC Developers Portal)
- o MySQL – a database

DoITT also uses Open Source software tools such as GitHub and Eclipse, which is an integrated development environment.

While we do not believe legislation is necessary to continue our progress in employing Open Source technologies where it makes sense to do so, we recognize the value of establishing broad goals for Open Source uptake – ones that are reasonable and supportable given what would be significant operational, training, funding, and migration requirements as reliance on Open Source increases.

Therefore, we believe the best approach for New Yorkers is for the City to continue along its steady, deliberate, and measured path to Open Source development and deployment. This path recognizes the value of Open Source and its tremendous potential for cost reduction while balancing the needs of 8.4 million New Yorkers, hundreds of thousands of employees, and thousands of applications across dozens of agencies delivering what are often vital services on a 24x7 basis. Any fundamental shifts in the underlying technology powering these systems and processes must be pursued with the utmost caution and due attention to potential impacts.

To that end, we look forward to continuing our dialogue with the Council about how we might achieve the goals of Intro. 366 as they relate to reducing the City's reliance on proprietary software, and options for the increased use of Open Source solutions as appropriate.

Thank you for the opportunity to testify this morning. I am now happy to answer your questions.

Thank you again.

To: NYC Council Committee on Contracts
From: David Moore, Executive Director, Participatory Politics Foundation
February 23rd, 2016

PPF

As a 501(c)3 non-profit organization with a mission to increase civic engagement, **I'm pleased to testify in favor of NYC Council Member Ben Kallos' proposed initiatives**, linked below on our open-source website NYC Councilmatic:

- Intro 365 of 2014, the Free & Open-Source Software Act (FOSSA); and
- Intro 366 of 2014, the Civic Commons Act

With nine years' experience developing open-source software for open government and public participation, I recognize the tremendous value of CM Kallos' proposed legislation and the principles behind them. Open-source code has proven to be the backbone of innovation, saving untold sums of money in efficiencies - in fact, institutional support for vital open-source was recently described by researcher Nadia Eghbal as the "biggest blind spot of the internet".

I first emphasize the massive potential of open-source innovation as reason to encourage licensing code open & libre - imagine all the popular & creative apps yet to come for participation in our representative democracy. Practically, there are reasons to institutionalize a preference for open-source solutions wherever possible in a city seeking to implement a "Council 2.0" digital roadmap. With vendors of government software, there's a risk of upselling for enhancements, de-prioritizing user experience, and a resistance to a collaborative roadmap towards liberating public data. These costs can be seen in the low public use of

Intro 365 will directly benefit software that's being developed in the wide community of public-interest contributors, with all the open-source benefits of innovation without undue bureaucracy. Intro 366 will coordinate and pool the valuable resources of city governments to improve the products used by constituents and increase the pool of developers contributing to shared resources.

To use the example of our open-source software for civic engagement, each of the following web apps could be supported for a non-profit development team: Shareabouts, for community mapping suggestions; AskThem, for public questions-and-answers and local issues; and Councilmatic, for city legislative transparency and public comment. Each component would add valuable & unique functionality and information to city-level engagement, e.g. for particiapatory budgeting programs, all open-data and libre ("free") and open-source to remix.

A typical price point for any one commercial citizen-feedback platform in a city is approximately $25,000 annually. If 12 cities nationwide banded together to support the above-described open, remixable, locally-hostable or SaaS package at $25,000 per year ($700 per app per month), the benefits for NYC and hundreds of following cities would be great.

Sincerely,

David Moore - drm@ppolitics.org - http://www.participatorypolitics.org/ - Twitter: @ppolitics

Mark Halegua, FarSight Data Systems   718-360-1712

Contracts Committee Hearing on Free and Open Source Act & Civic Commons

Date: Tuesday, February 23, 2016 - 10:00am

In selecting software for the various purposes necessary in city government functions and offices, there are a number of considerations: cost, long term viability and retention, security, and stability among them. There are two basic types of computer system services, servers and desktops. For the purposes of this hearing I am not going to discuss tablets or smartphones.

Open source software, including Operating Systems (OS), and applications – specifically office suites, databases, utilities, browsers, and more, are generally more secure than proprietary commercial software. This is because many more people are generally involved in the coding, testing, and debugging and across the world. Back doors are impossible to include in Open Source software as someone will most certainly see the vulnerability and fix or report it.

For the same reason stability is also higher.

As to cost, many Open Source projects are freely down loadable, copyable, and distributable. This alone can save, in the case of a government the size of New York City, millions of dollars in purchasing and licensing fees.

A desktop system with office software – for example LibreOffice or Openoffice – will save on the purchase of the OS, the office suite, and on many utilities. It will also save on software it will not be necessary to purchase, in most cases Anti-Virus software.

Because of the stability of the products, the government will likely save money on technical experts as fewer OS issues will result in fewer systems being down and requiring heavy monitoring. When they do go down, they will likely be down for a shorter period of time.

There is also the issue of file formats. LibreOffice and Openoffice both use the ISO standard Open Document Format (ODF) which many governments use for their expected long life in document retention (expected in the decades and longer) and for this standard not including any proprietary or binary parts, as well as for its comparative description brevity. The ODF is also free, and many different applications can and do use it, meaning long term access from different applications is possible, while maintaining document fidelity.

To make an example of a server class system, Microsoft servers require the purchase of the software (OS, SQL database, Mail/Collaboration suite, and others) plus seat licenses for each potential user, i.e., 100 seats /users for the OS, 100 seats/users for SQL Server, 100 seats/users for Exchange, etc. And that is for each server providing the required services/software. If you have 1000 users it is the same.

A Linux based server has no seat licensing. A SQL database (MySQL, MariaDB, Postgres, etc.) has no seat licensing. Zimbra, one of a number of Mail/Collaboration products has two types of licensing, an annual per seat or a one time perpetual buy but only one support call. By using a Linux based system

Mark Halegua, FarSight Data Systems

Contracts Committee Hearing on Free and Open Source Act & Civic Commons
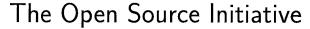
Date: Tuesday, February 23, 2016 - 10:00am

with one of the database systems, one copy may be installed on multiple computer systems at no cost other than the time of the System Administrator(s) who install and configure them.

Additionally, maintainance can be handled remotely on headless systems (after startup and installation, displays, keyboards, and mice are no longer needed). The remote access can be done from command line or from a Grap[hical User Interface (GUI) (if installed; Servers generally don't need GUIs to run their services).

Cost benefit for these types of servers is considerable when a buyer factors in the non-purchase of Microsoft products and that the servers don't need the same resources as MS products to provide high quality services.

Desktop systems can provide similar cost savings with their Open Source equivalents of OS, applications, and utilities.

Contracts Committee Hearing on Free and Open Source Act

Thank you to Council Member Benjamin Kallos for inviting the Open Source Initiative (OSI) to give testimony relating to Introduction 366-2014 and 365-2014. I am submitting this testimony on behalf of the OSI, as a member of the OSI's Board of Directors.

The Open Source Initiative is a 501(c)3 non-profit whose mission is to protect and promote open source software, development and communities, championing software freedom in society through education, collaboration, and infrastructure, stewarding the Open Source Definition (OSD), and preventing abuse of the ideals and ethos inherent to the open source movement.

Free and Open Source Software (FOSS) is software which, at its core, defends the rights of its users. As a body which is accountable to the taxpayers, it's the duty of any Democratic Government to be accountable to its citizens. By ensuring the Government operates using as much Free and Open Source Software as possible, you ensure that both the Government and its citizens have visibility into the software which is running the Government, as well as ensure citizens are able to truly use any works or data produced by the Government.

As technology starts to become a bigger part of how cities operate, it's critical that different components are able to interoperate and evolve as the city evolves. The ability to modify the software will only become more important as time goes on.

Even when it comes to support for a large-scale deployment, proprietary software forces the city to sign large contracts with a single vendor to ensure the systems continue to run. With Free and Open Source Software, commodity contractors are able to maintain these systems. This keeps the work at market rate, and allows the city to contract local software shops, helping taxpayers ensure they get the best value, and keeping city dollars with citizens.

Finally, by providing a shared platform that allows the city to collaboratively maintain and host software it depends on, you can provide an incentive to pool resources and in some cases engage citizens in collaboration, thus reducing cost to the taxpayer by eliminating redundancy by not having to maintain multiple installations of the same software.

Testimony of Prudence Katze, Research and Policy Manager
Common Cause/NY

Before the New York City Council Contracts Committee
2/23/2016

Thank you for the opportunity to testify. My name is Prudence Katze and I am the Research and Policy Manager of Common Cause/New York, a nonpartisan advocacy organization founded as a vehicle for citizens to make their voices heard in the political process and to hold government accountable. For more than thirty years, dedicated to representing the public interest, Common Cause/NY has worked at the state, federal, and municipal level to bring about honest, open and accountable government.

We appreciate the opportunity to speak on the possibilities of opening up and streamlining New York City's software infrastructure. Multiple city agencies use similar, or identical, software packages to conduct their day-to-day activities. Unfortunately, procurement contracts are often done on a department by department basis – which means thousands, if not millions, of dollars being paid in different contracts for one program spread out over multiple agencies. Intro 365 could potentially save the city thousands by implementing a plan of coordination between different departments when it comes to purchasing future software packages. Intro 366 goes even farther by requiring the Department of Information Technology and Telecommunications to limit future software purchases through fostering free and open source (FOSS) software programs and creating a city-wide directory. For these above reasons, Common Cause/NY is in favor of the passage of both bills.

Passing both bills will not only start us on a needed path of saving the city money, it will also give additionally flexibility for all departments in choosing software that best suits their constituents when they are able to tweak the code of an open source data platform. Instead of being locked into multi-year, proprietary contracts, the city will be able to focus more on fostering a responsive software and data ecosystem.

We have long advocated for more levels of government to bring software development and programming in-house. Currently, the pendulum has swung too far in the direction of out-sourcing important functions, relying on expensive private consultants, rather than developing and maintaining capability internally, with a work force that can be held directly accountable for performance and trained to stay current.

In our discussions with government entities who have developed their own software in-house, we have learned that a major advantage is not only detailed and knowledgeable customization that fits both the legal and performance requirements of the agency at a fraction of the cost of hiring outside consultants, but also the flexibility and increased responsiveness of having programmers on-staff, available to address problems quickly and knowledgeably.

We are pleased to see the introduction of Intro365 & 366 and support their enactment into law.

Testimony on the Free and Open Source Software Act

John Sullivan, Executive Director, Free Software Foundation
https://fsf.org, https://gnu.org
+1 (617) 388-8344, johns@fsf.org

Introduction

My name is John Sullivan. I'm the executive director of the Free Software Foundation, a 501(c)(3) charity founded in 1985 with a mission to defend the freedoms of computer users, primarily by making sure that all the software and documentation they use is licensed under terms that are free "as in freedom". We're based on Boston, but don't hold that against us. Our mission and our work are worldwide.

I have been at the Free Software Foundation since 2003.

Thank you for the opportunity to speak here today. We are very excited about the possibility of the Free and Open Source Software Act. Overall, this is an excellent bill and we look forward to its passage.

I want to confirm that, in our experience, it is in the best interests of New York City and its agencies to purchase software with a free "as in freedom" software license. It's good for the city's operations, and it's good for the city's people.

- This is the only way for the city to verify what the software it is purchasing and using actually does. As we saw recently with Volkswagen, who used proprietary software to fool EPA regulators for years, all software can be doing something very different under the hood than what it claims to be doing. This presents ongoing risks that can undermine the city's operations in many ways, including security concerns.

- Free software is the only way for the city to avoid being locked in to particular vendors. While just being able to view and audit the source code can help identify Volkswagen-like misbehavior, if the city cannot fire a vendor who delivers something wrong, and hire a different one to fix the very same software, then it will face the cost and inconvenience of having to start over, if a problem is detected. The freedom to modify that code is imperative, for the city government to truly retain sovereignty over its computing and protect its residents.

- Free software is also at the forefront of innovation. The free software program Linux is at the core of Android and of the GNU/Linux operating system. Android is now the most widely used general purpose operating system in the world. GNU/Linux powers the majority of servers on the

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Internet and an increasing number of personal and employee computers. It is not an exaggeration to say that free software is the reason we have mobile computing at all. Another example is Wordpress, which powers 25% of all Web sites, and is free software (see).

- And yes, free software will usually save money. Free software is not automatically free as in price – people are often paid to write it, and somebody has to be paid to maintain it. But the kind of artificial cost inflation encouraged by proprietary software can be avoided. The ability to choose between many vendors to work on any given software platform nearly always leads to lower prices. But at the same time, this also helps create a thriving business culture, where entrepreneurs have greater opportunities to provide services to the city than they do now.

The state needs to insist on free software in its own computing for the sake of its computational sovereignty. All users deserve control over their computing, but the state has a responsibility to the people to maintain control over the computing it does on their behalf. Most government activities now depend on computing, and its control over those activities depends on its control over that computing.

I do have some suggestions for how the bill could be improved.

- Free documentation should be added as an explicit goal. Good training is key to the success of any new software platforms in any organization. Documentation is also essential for enabling developers who didn't originally write the software to make changes to it. If there is no explicit requirement for free documentation, vendors could continue to hold agencies hostage by controlling and restricting distribution of the documentation for the software. This is a simple change, because the licensing requirements and definitions for free documentation are essentially the same as for software. Users must have the ability to use it how they wish, modify it, and share it.

- There should be a commitment to actually publishing the software. Software should be *published* under a free license, not just shipped to the city agencies under a free license. If the software *could* be published and shared but never *is* published or shared, many of the benefits won't be realized.

- The city should also make a commitment to, over time, stop requiring or recommending that residents use proprietary software. Proprietary software almost always belongs to a single company. Saying that a citizen has to interact with New York City government services using Adobe Reader only, or some company's JavaScript embedded on a city web page, is akin to telling me that my testimony will not be heard unless I show up wearing Nike shoes. This is a slightly different requirement than stating that there is a city goal to itself use more free software. The city should

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also make sure it is not still advertising or promoting the use of proprietary software by its residents. We'd like to see a requirement cataloging and reporting areas where the city currently requires or recommends that citizens use proprietary software.

Passing this bill would be a huge step for New York city and its residents. It would set an excellent example for cities around the country, and position New York at the leading edge of where technology is headed. The Free Software Foundation is certainly ready to help call positive attention to the city for doing this, and to help attract contributors to improve the resulting free software infrastructure. Thank you.

Testimony to the NYC City Council re: FOSSA Bill

I have a brief story that illustrates how the lack of understanding about open source software, open data and collaborative information systems among NYC agencies harms New Yorkers.

I'm an information management consultant for nonprofits. Immediately after Superstorm Sandy, I joined Occupy Sandy and helped coordinate the flow of data within that network and between it and nonprofits like the Red Cross and Salvation Army through the NYCVOAD. That's how I learned about the issue I'm here to discuss.

About a week and a half after Sandy struck New York City, the National Guard conducted a massive canvass of hard hit areas including the Rockaways and Staten Island to assess needs in those communities. They collected that data using tablets and proprietary software apparently procured by NYC MODA, who promised the VOAD organizations such as the Red Cross and Salvation Army that the city would share this data with them immediately.

The data never came. Days became weeks, then months and even to this day I have still not met anyone who has seen this potentially life saving data. To my knowledge, even NYC Service, the city agency tasked with the "Rapid Repairs" after Sandy, never got access either.

What happened to it? I don't know. My guess is that the vendor didn't have the capabilities they claimed to have had, they couldn't make the data available quickly enough, decision makers got embarrassed and swept the whole thing under the rug.

Canvassing data is critically important for determining how resources should be allocated during response and recovery phases of a disaster. It's the best way to figure out who needs what, and where. It's so important, in fact, that international humanitarian aid agencies have developed open source software tools to ensure countries in the "developing" could use smartphones and tablets to do canvassing after a disaster. We should have used that software instead.

To make matters worse, the same proprietary vendor who seems to have botched the canvass data project was also tasked with creating a work order management system for the City that would enable agencies and civic groups to coordinate cleanup. This system was supposed to be available within two months of Sandy, but I don't think it ever launched. What I do know is that while New York City agencies and nonprofits were waiting for this proprietary product to become available, municipalities and nonprofits in New Jersey and Long Island used a free and open source collaborative work order system called CrisisCleanup to coordinate their activities and cleaned up tens of thousands of houses of people affected by the storm.

Had New York City agencies been instructed to give preference to open source software solutions instead of third party vendor solutions, I believe thousands of New Yorkers would have received aid faster, better and cheaper, and the entire Sandy recovery process would have been more transparent, effective and responsive.

2/23/15 - Devin Balkind - devin@sarapis.org

Testimony submitted to the New York City Council Committee on Contracts Regarding the Free and Open Source Software Act and the Civic Commons Act

Good Morning. I am Karen Sandler, Executive Director of Software Freedom Conservancy. Thank you to Council Member Kallos and the Committee on Contracts for for inviting me to testify before you on the Free and Open Source Software Act (FOSSA) and the Civic Commons Act.

Software Freedom Conservancy is a New York 501c3 charitable nonprofit that promotes, improves, develops, and defends free and open source software. This issue is of great importance to an effective and safe functioning of government.

Free and open source software has many advantages over proprietary software. Studies show that, over time, free software is safer from vulnerabilities. Free software is auditable – security and functionality can be verified upon inspection. Anyone can independently assess the software and its risks. Developers can more easily and quickly repair discovered vulnerabilities or bugs (and bugs are very common in all software – the Software Engineering Institute estimates that an experienced software engineer produces approximately one defect for every 100 lines of code). Free software removes dependence on a single party, as anyone can make changes to their version of the software. And municipalities can hire any contractor on the open market to work on the software.

Companies effectively hold governments hostage with proprietary software. In the case of a security vulnerability, governments must wait for the vendor to admit there is a problem and then provide a fix for it. If the city needs a new feature or other functionality added, they are out of luck if the vendor doesn't consider that work high priority. If the company goes out of business, the city has to find another solution. Proprietary software locks the city into the original vendor forever. In contrast, if the city uses free software, anyone familiar with the software can become a vendor.

Perhaps more importantly, proprietary software companies increase licensing fees regularly, often annually. Fees are paid per user. As a city grows, the fees can rise at a rate much faster than inflation. Free Software liberates the municipality from these challenges. There are no licensing fees for Free Software. Furthermore, disputes with vendors over deployment can lead to costly claims about unpaid licensing fees. Free Software makes the licensing terms clear while providing the city with the rights to do whatever it needs and distribute or deploy the software

to all its citizens without consent of a contractor.

We at Software Freedom Conservancy believe that the Free and Open Source Software Act will protect the city from the greater expense and long term vulnerabilities of proprietary software.

Proprietary software companies get paid over and over from tax payer dollars for the exact same work. The collaboration inherent to free software assures that all municipalities pay for what they need exactly once, together. They can take advantage of this efficiency and collaborate to advance the technology that cities rely on.

The use of the disaster recovery software, Sahana, already in use here in New York and in many other municipalities, shows the huge benefits that can be gained from governmental use of free software. Sahana was first written to handle disaster recovery in Sri Lanka, yet it's been used and improved for use all over the world. Instead of each municipality starting from scratch, they build on each others' work. Every single improvement made in catastrophe response benefits everyone. I hope the city can learn from success of Sahana and adopt this framework for collaborating with other municipalities to pool their limited resources.

We believe that the Civic Commons Act will provide a framework to benefit from increased use of free software.

On a personal note, I am deeply familiar with the dangers of proprietary software. I have hypertrophic cardiomyopathy (I have a big heart) and have an implanted medical device with software that I cannot review or work with my healthcare professionals to modify. I rely on one company to ensure its safety and hope that they provide the life-critical updates I need. I have no real choice because there is no free and open source software defibrillator. I wonder every day if I will get an inappropriate shock or have my device fail through inaction. I live with proprietary software in my body, knowing that it has vulnerabilities I can do nothing about. As a lifelong New Yorker, I love this city and know that shifting to free and open software will better keep the city safe.

Software Freedom Conservancy fully supports these acts. I thank you for your time and interest. I am available to answer any questions that you may have .

Aidan Feldman
aidan.feldman@gmail.com

Testimony on New York City Bills Int. 0365-2014 and Int. 0366-2014

Dear Chairperson and Members of the Committee on Contracts–

Thank you for the opportunity to testify to the Committee in support of two important bills:

- **Int. 0365-2014:** Collaborative software purchasing[1]
- **Int. 0366-2014:** Free and open source software[2]

I am a software developer who has been living and working in NYC for six years, and in that time have been actively engaged with the developer and civic technology communities. I currently work for 18F, a 100% open source team in the federal government, though this testimony is being done in my personal capacity. In and outside of my job, I am a maintainer of dozens of open source projects, and actively contribute to and promote open source across a variety of programming languages. I should make clear that I am not a lawyer nor an expert in procurement or policy, but believe strongly in the value of open source and effectiveness of public services. I will present information as clearly and honestly as possible, and include references where applicable.

I am largely in favor of both bills, though have specific feedback on how each could be improved. In this testimony, I will discuss the general benefits of open source, particularly in the context of government, and then address each bill individually.

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[1]

http://legistar.council.nyc.gov/LegislationDetail.aspx?ID=1805839&GUID=D96EC359-9378-4037-9D09-EED8C57AE0A0

[2]

http://legistar.council.nyc.gov/LegislationDetail.aspx?ID=1805838&GUID=A29F5010-EEFA-44FE-81D0-E0F0937A99F7

Benefits of open source

For those that may not be familiar, "open source software" (OSS) means that the code for a system is made publicly available, and that it can (generally) be read, used, modified, and redistributed without royalties or restrictions. See Int. 0366-2014 §6-401(b) for the formal definition.

Interestingly, this bill is a perfect example of permissive licensing in action: the definition for "open source software" in §6-401(b)(1-10) is pulled directly from the Open Source Initiative (OSI) web site.[3] Normally, copyright laws would apply to content published on the web, so text could only be reused with express consent of (and often a fee paid to) the copyright holder. In this case, however, OSI's site footer specifies that:

> Opensource.org site content is licensed under a Creative Commons Attribution 4.0 International License[4].

Therefore, the content can be reused and repurposed without the knowledge or consent of OSI. While the bill *should* reference the OSI to be compliant with the license, it's important to note that this bill could not exist (as written) without the existence of permissive licenses for content. The sponsors of the bill didn't need to come up with a definition of "open source software" from scratch—they could take the canonical definition that has been developed and refined since 1998 by top experts in the field[5].

Procurement

Now, imagine a similar scenario, but applied to procurement. A piece of software may be purchased for one agency in government, but without carefully written contracts, use of that same software by another group or agency could require buying it again. These multiple procurements are a huge waste of both time and taxpayer dollars, but are all too common across governments of all levels.

Imagine instead that the software carried an open source license. If the software is custom-built, only one procurement would be required, and if it's available "off-the-shelf", the *entire* procurement process could be skipped. Any other agency in any government could then benefit from the existence of that software, skipping *their* redundant procurement cycles. There is also greater freedom to experiment with what software works best for a given problem, as there are lower financial/legal barriers to entry to evaluate the systems. Agencies can also be more

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[3] https://opensource.org/osd
[4] http://creativecommons.org/licenses/by/4.0/
[5] https://opensource.org/history

flexible in changing systems when it suits their needs, rather than feeling compelled to wait out the duration of a license.

Additionally, open source software means a reduction in vendor lock-in, because the source code can be read and modified by anyone, including a new contractor. Therefore, money spent on software contracts can be better spent in supporting and improving the software, rather than paying over and over for the same thing.

Security

A common misconception about open source is that the security of the system is sacrificed by making the code publicly available. This argument is known as "security through obscurity", and is specifically addressed (and refuted) by the National Institute of Science and Technology:[6]

> System security should not depend on the secrecy of the implementation or its components.

Relatedly, the Department of Defense issued a memo in 2009 stating:[7]

> The continuous and broad peer-review enabled by publicly available source code supports software reliability and security efforts through the identification and elimination of defects that might otherwise go unrecognized by a more limited core development team.

In other words, source code on popular open source projects is monitored by many people, meaning it is often more secure than its proprietary equivalent.

It's important to note that source code being public is completely separate from data being public—an open source project is no more likely to reveal sensitive information than one that is closed source.

Adoption

Open source software is widely leveraged in the technology industry. Among the top million most popular web sites:

- Over 78% are powered by an open source web server[8]

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[6] NIST Special Publication 800-123, Guide to General Server Security:
http://csrc.nist.gov/publications/nistpubs/800-123/SP800-123.pdf
[7] DoD Clarifying Guidance Regarding Open Source Software (OSS):
http://dodcio.defense.gov/Portals/0/Documents/FOSS/2009OSS.pdf
[8] http://trends.builtwith.com/web-server

- 79% use jQuery, an open source JavaScript library[9]

Aside from what has been mentioned above, open source software (particularly projects with strong communities) have the following benefits:

- Issues that have been previously encountered are often documented on public sites, meaning that solutions can be found without relying on a support contract.
- Agencies can benefit from upgrades made by the community "upstream", without the need for paid upgrades. Conversely, any improvements made by the city will benefit the users of the software, and thus contribute to the greater good.
- If a piece of software needs to be modified to suit an agency's needs, the code is immediately available to do so, and there is no risk of violating the terms of a license.
- Because data formats used by open source (and the code used to generate them) are almost always open, there is generally better access to and portability of data than in proprietary systems.
- As noted in the introduction to Int. 0366-2014, the availability of the code means greater transparency and ease of auditing.

Free and Open Source Software Act (FOSSA)

As mentioned before, I am largely in support of this bill. In this section, I will go over areas where it can be improved.

Open vs. closed source

The introduction states that free/open source software provides the following:

- Availability, succession, and permanence of the city's data
- "Interoperability through adherence to open, platform-neutral standards"
- Dictate "how, and for how long, the city may use the software it has acquired"
- Ensuring that software doesn't, "in addition to its stated function, also transmit data to, or allows control and modification of its systems by, parties outside of the city's control"

Though these desirable conditions are easier to achieve through open source, it's important to note that these requirements *could* be written into contracts for proprietary systems. Therefore, I believe that these points should be included in the text of the bill itself as requirements for all software procured by the city, but separate them from the stated benefits/requirements of the license.

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[9] http://trends.builtwith.com/javascript/jQuery

Off-the-shelf vs. custom software

One thing I noticed in this bill is the lack of distinction between off-the-shelf vs. custom software. Off-the-shelf software (e.g. LibreOffice, a word processing program[10]) can generally be downloaded and used as-is, whereas custom software needs to be developed specifically for the city/agency (e.g. nyc.gov).

While I clearly have strong feelings about the benefits of open source, I am also pragmatic about the tradeoffs. For example, use of "cloud" software (e.g. Amazon Web Services or Google Apps) can greatly reduce the operational burden/costs of the city, despite the fact that those systems are rarely open source and don't necessarily provide the same level of control over data as self-deployed solutions would. In such cases, the benefits of using proprietary products may outweigh the fact that they are not open source.

My suggestion would be that each software need be evaluated on a case-by-case basis for its effectiveness in completing the stated objectives, with the following (possibly weighted?) considerations:

Pros
- Open source
- Available off-the-shelf
- Commodity software (i.e. is a similar offering available from multiple providers, and would the switching cost be relatively low?)
- Cloud-based
- Large community
- Comprehensive documentation

Cons
- Closed source
- Needs custom development/maintenance
- Offering unique to that provider
- Needs to be deployed by/for the city

Additional suggested requirements

The following requirements should be added to the bill explicitly:

- Any software that is custom-developed for or by the city should be released under a license approved by the Open Source Initiative[11], if not dedicated to the public domain.

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[10] https://www.libreoffice.org/
[11] https://opensource.org/licenses/

- Any contract for custom software should require transfer any copyright in the work to the government.[12]
- The public release of custom software should include all design documents and documentation pertaining to the project.
- All software should use open, standard, and well-documented data transfer and storage formats. There should be no restriction on the ability to read/write/convert to/from these formats.
- All custom software should be developed in the open from the start, and allow/foster participation/collaboration with the broader government community and the public.
  - *This is in contrast to the "throw it over the wall" approach to open source, where the code is developed behind closed doors, and only publicly released once, or at infrequent intervals. This all but guarantees that the project will receive no outside contributions, and may contribute to fragmentation around the project community.*[13]

One open question: does there need to be any language in the bill pertaining to patents? This is an issue that can often complicate the use of open source software.

Civic Commons Act

Collaboration

The part of this bill that jumped out the most was the following in §6-403(a):

> *coordinate with jurisdictions outside of the city of new york regarding the procurement of software*

I don't know of any initiative like this from any other government—I think it will be the most impactful piece of the entire bill, and also the most difficult to accomplish.

Implementation details

The original press release for the Civic Commons Act associated the bill with Code for America's Civic Commons platform.[14] Unfortunately, the marketplace software[15] no longer seems to be hosted at Commons.CodeForAmerica.org. This sort of turnover is unfortunately common for community projects without a corporate or institutional backer, and is an example of

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[12] https://theunitedstates.io/licensing/#for-government-works-produced-by-a-contractor
[13] Described in greater detail at http://wiki.civiccommons.org/Releasing_Open_Source/
[14]

http://benkallos.com/press-release/tech-legislation-establish-free-and-open-source-software-preference-and-code-sharing-i
[15] https://github.com/CivComs/Mktplc

why a bill should not be tied to a specific piece of software. It may be useful to detach the idea of "a...FOSS portal...to facilitate collaborative software purchasing" from Civic Commons specifically.

That being said, wiki.civiccommons.org is a wonderful resource, which would largely benefit from use and contribution by the city government. These kinds of open guides are practically zero-cost to run and maintain, but can be hugely beneficial.

In general, this bill may place too much emphasis on the implementation details (e.g. building a portal), rather than setting desired outcomes and allowing the program office to identify the best solution. There may be research that went into this bill that I'm not aware of, but the user-centered approach would be to ask the question, "what are the biggest obstacles for procurement specialists and/or program offices to adopt open source software?" The answer may be discoverability of existing options, which a portal would solve, though it's worth investigating if there are other large hurdles.

Source code

The text is somewhat confusing in whether "Civic Commons software source code" refers to code for the software listed on the site, or the code for the portal itself. For example, while the portal provides a listing of open source software for agencies to consider, is the intention that it will also provide hosting and collaboration features for that code? There is no shortage of platforms that solve this need well (in descending order of popularity: GitHub, BitBucket, and GitLab), and any custom/standalone solution will decrease the likelihood of outside contributions. I don't believe there is any benefit in trying to reinvent the wheel here. I would recommend providing *guidance* on tools, but ultimately allow agencies to determine which best suit their needs.

Additional feedback

The following points should also be addressed more directly in the text of the bill:

- Point out that the agency in charge of developing the portal will also be responsible for maintenance.
- The agency responsible for the platform should encourage community engagement for the projects and overall platform, with city and external government users, as well as the public.
- The agency (and the platform itself) should encourage modern/forward-thinking development workflows for the software listed on the platform.
    - Ensure there are clear instructions about how to build/deploy each piece of software.
    - Making it clear where to go with support questions, feedback, contributions, etc.

- o Using package management, build tools, containerization, and other strategies for making deployment as easy as possible.
- What software is *required* to be listed on the portal, if any?

Conclusion

Open source software can be an enormous benefit to governments of all sizes, and adoption on the scale of New York City could make a huge difference in the open source ecosystem. There are countless software collaboration opportunities with other governments, companies, and the public, all while improving the efficiency and efficacy of NYC. I applaud the Council for considering these important bills, and hope they pass with the relatively minor changes suggested in this letter. I am happy to be a resource if you have any further questions. Thanks again for your time.

Sincerely,

Aidan Feldman
aidan.feldman@gmail.com

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[16] https://creativecommons.org/publicdomain/zero/1.0/

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

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(PLEASE PRINT)

Name: Kevin Macic

Address: 1411 E 99th

I represent: My Self

Address: 1411 E 99th ST, B, NY 11236

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I represent: _____

Address: _____

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Date: 2/23/2016

(PLEASE PRINT)

Name: Karen Sandler

Address: 385 11th St, Brooklyn

I represent: Software Freedom Conservancy

Address: 137 Montague St. STE 380, Brooklyn

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I represent: BETANYC

Address: _____

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Name: Doug Turetsky

Address: 110 William St

I represent: NYC Independent Budget Office

Address: _____

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Name: Devin Balkind

Address: 134 Spring St #302

I represent: _____

Address: _____

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THE CITY OF NEW YORK

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☑ in favor ☐ in opposition

Date: 2/23/2016

(PLEASE PRINT)

Name: Prudence Katze

Address: _____

I represent: Common Cause / NY

Address: 80 Broad Street

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THE CITY OF NEW YORK

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I intend to appear and speak on Int. No. 365, 366 Res. No. _____

☑ in favor ☐ in opposition

Date: 2-23-16

(PLEASE PRINT)

Name: David Moore

Address: 148 Lafayette St, 12th - NYC

I represent: Participatory Politics Fdn

Address: "

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I intend to appear and speak on Int. No. 365-366 Res. No. _____

☑ in favor ☐ in opposition

Date: 2/23/16

(PLEASE PRINT)

Name: Aidan Feldman

Address: 210 Park Pl. #3C, Brooklyn, NY 11238

I represent: myself

Address: _____

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| *Appearance Card* |

I intend to appear and speak on Int. No. *365 & 366* Res. No. _____

☐ in favor   ☐ in opposition

Date: *23 February 2016*

(PLEASE PRINT)

Name: *Don Sunderland, Deputy Commissioner - NYC DoITT*

Address: *2 MetroTech Center, 4th Floor, Brooklyn, NY*

I represent: *NYC DoITT*

Address: *2 MTC.*

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| *Appearance Card* |

I intend to appear and speak on Int. No. *366* _____ Res. No. _____

☒ in favor   ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: *PAUL TAGLIAMONTE*

Address: *250 K St NW, WASHINGTON DC*

I represent: *OPEN Source Initiative*

Address: *855 el Camino Real, 13A #270 Palo Alto, CA*

▶ *Please complete this card and return to the Sergeant-at-Arms* ◀

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I intend to appear and speak on Int. No. 366 Res. No. _____
☒ in favor ☐ in opposition

Date: 2/23/2016

(PLEASE PRINT)

Name: JOHN SULLIVAN

Address: 51 FRANKLIN ST, 5TH FL, BOSTON MA 02110

I represent: FREE SOFTWARE FOUNDATION

Address: 141 MERIDIAN ST #3, BOSTON, MA 02128

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| Appearance Card |

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☐ in favor ☐ in opposition

Date: 2/23/16

(PLEASE PRINT)

Name: Guy Oliveri

Address: 253 Broadway 9th Fl.

I represent: MOCS

Address: _____

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