Revised Baseline Estimates of D.C. Government Revenues

February 24, 2021

A Methodology Report by District Economics Group

Office of the District of Columbia Auditor

Kathleen Patterson, District of Columbia Auditor

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Office of the District of Columbia Auditor

February 24, 2021

The Hon. Phil Mendelson
Chairman
Council of the District of Columbia
1350 Pennsylvania Avenue, N.W.
Washington, DC 20004

Dear Chairman Mendelson and Councilmembers:

In 2019 the Office of the D.C. Auditor published a revenue forecasting model to serve as an independent assessment of the revenue estimates provided by the Office of the Chief Financial Officer (OCFO) when the District of Columbia issues general obligation bonds. The D.C. Official Code § 1-206.03 (b)(1) requires that the D.C. Auditor certify the accuracy of the OCFO estimate as follows:

> *No general obligation bonds… or Treasury capital project loans shall be issued during any fiscal year in an amount which would cause the amount of principal and interest required to be paid both serially and into a sinking fund in any fiscal year on the aggregate amounts of all outstanding general obligation bonds and such Treasury loans, to exceed 17% of the District revenues… which the Mayor estimates**, and the District of Columbia Auditor certifies**, will be credited to the District during the fiscal year in which the bonds will be issued…*

Today we share an update to the forecasting model developed for ODCA by the District Economics Group (DEG) titled **Revised Baseline Estimates of D.C. Government Revenues.** We will continue to use the model for revenue certifications in the upcoming year and appreciate the continuing assistance of Chief Financial Officer Jeffrey S. DeWitt and Deputy CFO and Chief Economist Fitzroy Lee in providing DEG with current and historical revenue data.

The forecast model update adjusts the revenue baseline after incorporating information from the OCFO's December 2020 Revenue Estimates and the 2020 Comprehensive Annual Financial Report (CAFR). The DEG estimate for FY2020 was somewhat lower than the District's actual FY2020 non-dedicated Local Fund Revenue number. The DEG estimate for FY 2021 is just slightly under the OCFO's estimate.

We continue to experience significant effects from the COVID-19 global pandemic that bring uncertainty and substantial risks to the financial outlook. The DEG forecast includes an alternate scenario of a one-year delay in the recovery from the pandemic which could result in significant reductions to revenues. Exploring and preparing for alternate scenarios should be part of the Council's oversight of Fiscal Year 2021 spending as you begin your review of the Fiscal Year 2022 budget.

I hope this update and our ongoing independent assessment of the District's revenues will be of value to the D.C. Council as well as to the OCFO and others in the executive branch and District residents.

Sincerely yours,

Kathleen Patterson
District of Columbia Auditor

Revised Baseline Estimates of D.C. Government Revenues
For the Office of the District of Columbia Auditor

February 18, 2021

Washington, D.C.

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Introduction

In October, District Economics Group (DEG) provided the Office of the District of Columbia Auditor (ODCA) with an update on our model forecasts for the District's FY 2020 revenue streams and our thoughts on the COVID-19 pandemic's impact.

After monitoring for changes in national and D.C. GDP estimates and for the release of the Office of the Chief Financial Officer's (OCFO's) December 2020 Quarterly Revised Revenue Estimate and the February 2021 release of the Comprehensive Annual Financial Report (the FY 2020 CAFR) for the fiscal year ending September 30, 2020, DEG has further revised its model to reflect the most recent data available. This report revises forecasts for FY 2021 through 2024 of District revenues and compares DEG's October 2020 estimated FY 2020 non-dedicated Local Fund Revenue estimate with the actual amounts for these revenues from the FY 2020 CAFR. This update reflects the impacts of the pandemic-induced shutdown on the District's revenue streams and the growth path of its economy through fiscal year 2024.

Changes to the economic forecast

DEG's February 2021 forecast of D.C. Gross Domestic Product (GDP) for Calendar Year 2020 is $145.40 billion compared with the October 2020 forecast of $147.95 billion, $2.55 billion or 1.72% less.[1] The downward revision to GDP in our model is due to the Bureau of Economic Analysis' (BEA) revised calendar year annual estimates of D.C. GDP for 1997-2019. BEA revised D.C. GDP for 2019 downward by $2.805 billion, from $146.19 billion to $143.39 billion.[2]

DEG forecasts future values of D.C. GDP with an auto-regressive moving average model (ARIMA). This model uses historical values of D.C. GDP to forecast future values of GDP. The downward adjustments to historical D.C. GDP values by the BEA used in DEG's February 2021 forecast thus lead to future D.C. GDP estimates that are smaller than in the DEG October 2020 forecast.[3]

Of note, amidst generally downward revisions to the historical GDP by the BEA, this update also accounts for an *upward* revision to the D.C. GDP growth rate for FY 2020 in the OCFO's December 2020 Revenue Estimate release from earlier estimates by the OCFO. While the OCFO's September 2020 Quarterly Revised Revenue Estimate, which was incorporated into DEG's October 2020 estimate, forecasted an annual growth rate for D.C. GDP of 1.2% for FY 2020, the more recent December Quarterly Revised Revenue Estimate forecasts annual D.C. GDP growth at +1.4%. However, this slight increase in the growth rate is far outweighed in DEG's model by the BEA's largely downward revisions to previous annual D.C. GDP figures.

[1] Revised D.C. GDP from BEA available at http://tinyurl.com/y5dgcwer.

[2] DEG's October 2020 update was done prior to the publication of the BEA's October 2020 revisions to its annual current-dollar GDP data for the District of Columbia. The BEA update included revised annual D.C. GDP statistics for each year in 1997-2019. While these adjustments were not uniformly in one direction, it is notable that nine of the ten annual data points for 2010-2019 saw downward revisions whereas each year in 2002-2009 saw a relatively small upward revision. D.C. annual GDP was revised downward by $2.805 billion, $1.887 billion, and $1.189 billion for 2019, 2018, and 2017 respectively.

[3] For a detailed explanation of the DEG forecast see "Modeling the D.C. Economy, Revenues, and Debt Service Obligations: A Methodology Report by District Economics Group", Office of the District of Columbia Auditor, November 13, 2019

Below is a chart showing how the February 2021 DEG forecast of Calendar Year D.C. GDP (bold maroon dashed/dotted line) is below the October 2020 DEG forecast (red dotted line), and further below the March 2020 DEG forecast (black dashed line) which was created before the District's sharp economic contractions in April, May, and June could be incorporated into the model.

Chart 1. Revised DC GDP Forecast CY 2020-2024, as of February 18, 2021

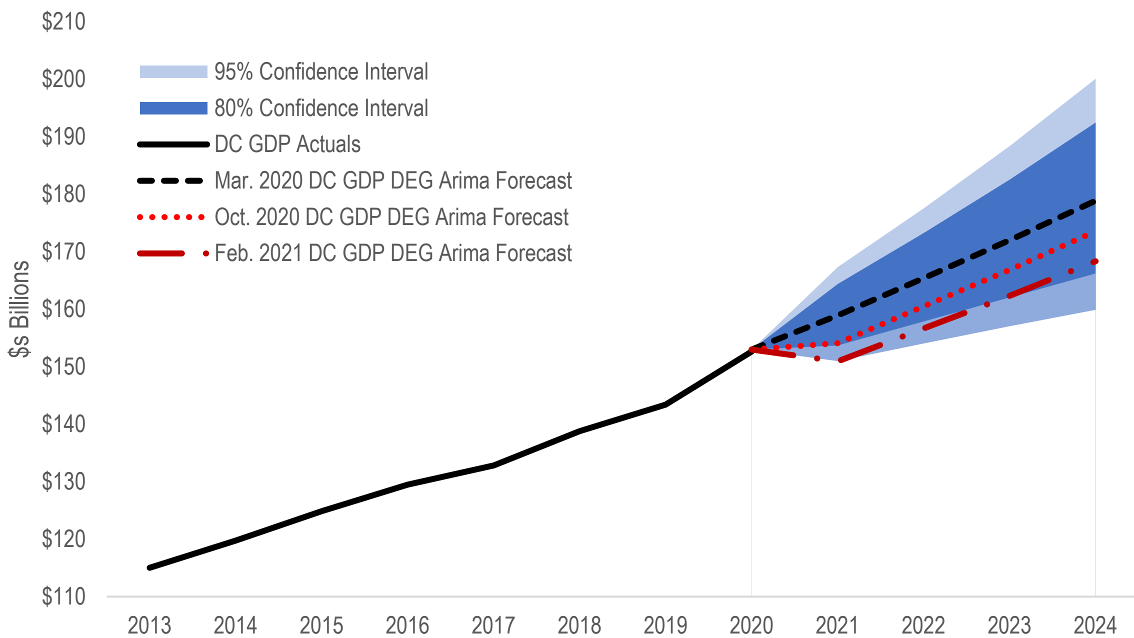

Table 1 below displays the DEG D.C. gross revenue forecast next to the D.C. OCFO's forecast. The DEG and OCFO revenue forecasts are similar but the DEG forecast of future D.C. GDP is significantly smaller than the OCFO December 2020 Revised Revenue Estimate forecast. The GDP forecast differences are partly due to the BEA revisions to D.C. GDP (footnotes 1 and 2) and partly due to modeling the annual changes in revenues impacted by the pandemic.

Table 1. Comparison of DEG February 2021 and OCFO's December 2020 forecasts for Fiscal Year D.C. GDP and Gross Revenues as of February 18, 2021.

Fiscal Year	DEG D.C. GDP Forecast ($billions)	D.C. OCFO GDP Forecast ($billions)	DEG D.C. Gross Revenues Forecast ($thousands)	D.C. OCFO Gross Revenues Forecast ($thousands)
2020	144.5	144.3	8,607,979	8,796,527
2021	149.0	150.1	8,525,023	8,526,781
2022	154.6	159.2	9,071,788	9,076,136
2023	160.2	167.8	9,484,959	9,464,492
2024	166.0	175.4	9,912,914	9,865,144

Changes to the revenue forecast

Table 2 below highlights the changes in the DEG forecast. The February 2021 DEG forecasted revenue streams (orange shaded columns) are displayed next to DEG's prior estimates from October 2020 (gray shaded columns). The forecasts are *gross* revenue streams *before* the dedicated revenues are netted out. The white columns show the change in DEG's forecasts from October 2020 to February 2021.

DEG's prior, October 2020, estimates for FY 2020 – FY 2024 were prepared using data from the OCFO's September 2020 Revised Revenue Estimate. The OCFO's September 2020 Revised Revenue Estimate showed an upward revision of $222 million from its April 2020 Revised Revenue Estimate of a decline of $722 million in the District's FY 2020 Local Source, General Fund Revenue. The OCFO's April 2020 Revised Revenue Estimates for the first time accounted for the impact of the pandemic on the District's revenues. In contrast, our February 2021 estimates are prepared using actual FY 2020 revenues from the OCFO's FY 2020 CAFR, which details a further upward revision of $171 million, attributed to stronger than expected income and property taxes. Additionally, the OCFO increased its estimates for FY 2021 – FY 2024 revenues from its September 2020 Revised Revenue Estimates, citing faster than anticipated recovery from the pandemic.[4] The large revisions by the OCFO to the District's FY 2020 revenues during the pandemic, first as a downward $722 million and then followed by upward revisions of $222 million and $171 million for a net change from the original budget forecast of -$329 million, reflect the great uncertainty that revenue forecasters confront, and continue to confront, about the impact of the pandemic on District revenues.[5]

While the OCFO's December 2020 Revised Revenue Estimate forecasted higher revenues for FY 2021 – FY 2024 than its September 2020 Revised Revenue Estimate, DEG's February 2021 model update predicts lower revenues in each of these fiscal years than the DEG October 2020 model update. This is, in part, due to the nature of DEG's ARIMA models which forecast the District's various revenue streams based upon historical values of D.C. GDP. The BEA's predominantly negative revisions to D.C. GDP from 2010 through 2019 led to decreased estimates of historical D.C. GDP in our February 2021 model as compared with our October 2020 model. The impacts of these downward revisions by the BEA in the DEG model outweighed the improved FY 2021 outlook through FY 2024 forecasted by the OCFO in the December 2020 Revised Revenue Estimate. Additionally, and importantly, DEG adjusted its February 2021 forecasts for actual revenues for each tax revenue source shown in table 2, from the District's FY 2020 CAFR to better reflect the downward impact of the pandemic on these revenues. DEG modeled the pandemic's effects on revenues for FY 2021 through FY 2024 from the OCFO pattern for these revenues shown in their December 2020 Revised Revenue Estimate.[6]

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[4] See the September 2020 Revised Revenue Estimates released on September 30 and the December 2020 Revised Revenue Estimates released on December 30 by the Office of the Chief Financial Officer of the Government of the District of Columbia. https://cfo.dc.gov/node/305482

[5] To illustrate the uncertainty around revenues during the pandemic the FY 2020 CAFR released two months after the OCFO December 2020 Revised Revenue Estimates in February 2021 (see page 173) shows a net change in total tax revenues from the original budget forecast for FY 2020 of -$134 million.

[6] The FY 2020 Comprehensive Annual Financial Report can be found at https://cfo.dc.gov/page/comprehensive-annual-financial-report-cafr-2020. Revenue stream actuals sources from Exhibit A-4 District of Columbia Schedule of Local Source Revenues (page 173).

Table 2. Revised Gross Fiscal Year Revenue Stream Forecasts as of February 2021 (in orange) and October 2020 (in grey) as of February 18, 2021 ($ Thousands). Actual amounts in bold from the FY 2020 CAFR.

Fiscal Year	Income tax revenue			Property tax revenue			Sales and excise tax revenue		
	Oct-20	Feb-21	Difference	Oct-20	Feb-21	Difference	Oct-20	Feb-21	Difference
2019	**$2,941,982**	**$2,941,982**	$0	**$2,827,757**	**$2,827,757**	$0	**$1,707,223**	**$1,707,223**	$0
2020	$2,983,849	**$3,104,933**	$121,084	$2,871,846	**$2,910,481**	$38,635	$1,729,233	**$1,280,662**	-$448,571
2021	$3,131,228	$3,080,130	-$51,098	$3,027,046	$2,894,971	-$132,075	$1,806,713	$1,164,862	-$641,851
2022	$3,282,969	$3,217,528	-$65,441	$3,186,839	$2,865,918	-$320,921	$1,886,486	$1,457,179	-$429,307
2023	$3,434,937	$3,355,489	-$79,448	$3,346,872	$2,938,526	-$408,346	$1,966,378	$1,581,187	-$385,191
2024	$3,595,824	$3,499,057	-$96,767	$3,516,297	$3,022,147	-$494,150	$2,050,959	$1,727,161	-$323,798
Fiscal Year	**Other tax revenue**			**Gross receipts revenue**			**Nontax and lottery revenue (1)**		
	Oct-20	**Feb-21**	**Difference**	**Oct-20**	**Feb-21**	**Difference**	**Oct-20**	**Feb-21**	**Difference**
2019	**$583,377**	**$583,377**	**$0**	**$395,068**	**$395,068**	**$0**	**$664,291**	**$664,291**	**$0**
2020	$546,511	**$427,351**	-$119,160	$389,623	**$323,597**	-$66,026	$598,271	**$560,955**	-$37,316
2021	$598,129	$555,493	-$42,636	$404,234	$404,234	$0	$617,150	$425,334	-$191,816
2022	$653,405	$599,887	-$53,518	$407,477	$407,477	$0	$636,587	$523,798	-$112,789
2023	$708,872	$644,762	-$64,110	$417,163	$417,163	$0	$656,054	$547,831	-$108,222
2024	$771,819	$694,424	-$77,394	$423,198	$423,198	$0	$676,663	$546,927	-$129,736

(1) DEG's October 2020 estimates for nontax and lottery revenues in this report differ from the values of the matching column in DEG's October 2020 report. As noted by the change in the column name from "nontax, lottery, and special purpose revenue" to "nontax and lottery revenue," DEG removed estimates for special purpose revenues from these amounts. This is done to better align revenues to the Certification Table (Table 3) below and to more clearly illustrate the annual changes in these revenues from the revised estimates.

To demonstrate the effect of the revised gross revenue streams on the ODCA certification estimates, Table 3 below uses the actual FY 2020 revenue streams after netting out any dedicated revenues from the gross revenues, from the FY 2020 CAFR to update the D.C. Auditor Certification Table. Table 3 provides DEG's February 2021 estimate of the District's FY 2021 Total Local Source, General Fund Revenue at $7.89 billion, as well as the District's corresponding FY 2020 actual revenues for comparison. Of note, the District's FY 2020 Total Local Source, General Fund Revenue was $7.96 billion, approximately $410 million or 5 percent lower than DEG's October 2020 estimate of $8.37 billion.

Table 3. Actual FY 2020 and DEG Estimates of FY 2021 Total Local Source, General Fund Revenue (Net of Dedicated Taxes) as of February 18, 2021 ($ Thousands).

Revenue Source	FY 2020 Actual Revenues (Net of Dedicated Taxes)	DEG FY 2021 Estimated Revenues (Net of Dedicated Taxes)
Property Taxes	$2,866,869	$2,847,436
Sales Taxes	$877,368	$784,408
Income Taxes	$3,104,933	$3,080,130
Gross Receipts Taxes	$192,776	$268,822
Other Taxes	$360,116	$486,348
Total Taxes	$7,402,062	$7,467,144
Total Non-Tax and Lottery Revenues	$560,955	$425,334
Total Local Source, General Fund Revenue Estimate	$7,963,017	$7,892,477

Issues with forecast revision

DEG sourced actual revenue collections data from the FY 2020 CAFR and the forecasted annual growth rates for revenue from FY 2021 through FY 2024 using the OCFO's December 2020 Revised Revenue Estimates. The District's revenue streams show a mixed performance with actual income and property tax collections exceeding original forecasts but sales and excise tax and non-tax and lottery revenue collections below original forecasts. It is the OCFO's expectation that these collections will continue to lag previous forecasts as the economy recovers in the coming fiscal years.[7]

Revenues reliant on in-person customers, commuters, or occupied offices were most affected by the business activity restrictions put in place to control the spread of COVID-19: sales and deed taxes, as well as licenses and fines. Sales tax revenues declined by 23.5% in FY 2020, bearing the brunt of the pandemic-induced business disruptions. Within that stream, the hospitality tax revenue generated from hotels and restaurants notably declined by 46% in FY 2020. Deed tax revenue dropped by almost 20% in FY 2020 due to a significant decline in commercial property sales. Additionally, nontax revenue for FY 2020 declined by 15.6%, reflecting reduced revenue from traffic fines and buidling permit fees. The OCFO expects these types of revenues to decline further in FY 2021. Gross receipts tax revenues declined by 18.1% in FY 2020 with revenues from public utilities, toll communications, and ballpark fees declining more than modest increases in insurance premium taxes and health related taxes.[8]

Property tax revenues increased in FY 2020 by 2.9%, but this growth represents increases in property assessments during FY 2019. The OCFO forecasts property tax revenue will decrease in FY 2021 and FY 2022 before beginning to recover in FY 2023. Income and business tax revenues performed relatively well, growing 5.5% in FY 2020, buoyed by 1) witholding tax revenue from high-wage workers who continued to work from home and 2) a strong economy in 2019 that translated into corporate franchise tax growth of 13.3% for FY 2020. Despite the expectation of higher deliquencies from properties most affected by the pandemic such as hotels and retail locations, the property tax collection rate was a strong 97.4%, similar to the District's FY 2019 collection rate according to the OCFO's December 2020 Revised Revenue Estimate.

DEG's model, which is based on an autoregressive moving average of GDP, forecasts future estimates for D.C. GDP based off of historical values for D.C. GDP. Despite the economic effects of the unprecendented shutdown, D.C. GDP *grew* 1.4% in FY 2020 according to the OCFO December 2020 Revised Revenue Estimate. DEG's models do not fully capture the divergence among the revenue streams directly impacted by the loss of hospitality and office-worker and tourist traffic in the District from those that are less impacted, like income taxes. To account for this, as noted on page 4, DEG adjusted certain revenue streams "off-model" to reflect annual changes in expected revenues consistent with the impacts of the pandemic. These adjustments rely upon the OCFO December 2020 Revised Revenue Estimates and projections of the annual growth rates revenues from 2020 through 2024 for

[7] See "Revenue Highlights" section of the OCFO's December 2020 Revised Revenue Estimate, detailing expectations for the timing of the recovery of property tax, sales tax, income tax, deed tax, and non-tax revenue. Of note, the OCFO expects real property tax revenue to fully recovery to FY 2020 levels by FY 2023, whereas a full recovery of sales tax to FY 2019 levels may not occur until FY 2024 (December 2020 Revised Revenue Estimate, pages 3-5).

[8] DEG's forecast for gross receipts taxes did not change from the October 2020 forecast because in the DEG model these revenues follow a "random-walk" with respect to D.C. GDP.

three sources that are forecasted to be most impacted by the pandemic: property taxes, sales and excise taxes, and non-tax and lottery sources.

Looking forward, the economic damage from the pandemic, including the resurgence of the virus late last year, has created an uncertain outlook for the District. As the OCFO's December 2020 Revised Revenue Estimates indicates, significant risks to the District's revenues still remain: office workers may decide to permanently work from home reducing the need, and over time the demand, for office space. If businesses become "virtual" and workers reside outside of the District, this could further impact business tax revenues. If consumers lose confidence in the safety of participation in entertainment activities, this could challenge the District's significant tourist and convention businesses and negatively impact revenues. Consumers, and businesses, may currently benefit from deferred payments for rent, utilities, and credit card payments but when these deferral periods end there could be new financial strains that could also challenge revenue collections. These elevated risks to the economy render modeling future D.C. revenues difficult, relying on assumptions about its path toward recovery, taking into account the pandemic's long-term effects as well as these sustained risks. We explore this uncertainty in the Alternate Scenario Forecasting section below.

Alternate Scenario Forecasting

DEG also forecasts the District's revenue streams under an alternate scenario, in which D.C. experiences a slower than expected recovery from the pandemic. This scenario delays the pace of the OCFO December 2020 Revised Revenue Estimates projected recovery in revenues for property tax, sales and excise taxes, and non-tax revenues by a full year while leaving unchanged DEG's forecast for revenues from income taxes, other tax revenue, and gross receipts taxes. This highly stylized scenario reflects a prolonged impact on the District's revenues from economic activity that is most directly affected by the pandemic while optimistically considering no effect on the revenues that did not decrease due to the pandemic during FY 2020. This scenario may, for example, reflect a surge in the virus during the spring and/or summer of 2021 that delays a recovery by one year. Table 4 below compares DEG's estimates for D.C. Gross Revenues under the baseline scenario from Table 1 and under this alternate scenario of a one-year delay to the recovery of the District's economy.

The impact of a one-year delay in the recovery from the pandemic through 2021 could reduce FY 2022 revenues by 6.9%; FY 2023 revenues by 5.1%; and FY 2024 revenues by 5.0% from the DEG baseline forecast in tables 1 and 2. Given the highly volatile nature of the pandemic, the emerging presence of much more transmissible variants of the virus, and the logistical challenges of vaccinating a large population in a short period of time, even this highly stylized alternate scenario illustrates that the virus poses significant challenges to these sources of revenues going forward.

Table 4. Comparison of DEG February 2021 Alternate Forecast and OCFO's December 2020 forecasts for Fiscal Year D.C. GDP and Gross Revenues as of February 18, 2021.

Fiscal Year	DEG D.C. Gross Revenues Forecast ($thousands)	Alternate Scenario DEG D.C. Gross Revenues Forecast ($thousands)	Percent Change
2020	8,607,979	8,607,979	
2021	8,525,023	8,525,023	
2022	9,071,788	8,443,129	-6.9%
2023	9,484,959	8,997,379	-5.1%
2024	9,912,914	9,417,292	-5.0%

Conclusion

The District's actual FY 2020 non-dedicated Local Fund Revenue was $7,963,017,000 or 94.5 % of our estimate of $8,425,472,000 shown in our March 2020 certification analysis to the D.C. Auditor. DEG projects FY 2021 non-dedicated Local Fund Revenue will be $7,892,477,000, which is 0.89% less than the District's actual FY 2020 amount and 0.02% less than the OCFO's estimate for FY 2021 of $7,894,236,000. Significant challenges remain to this forecast as the course of the pandemic remains uncertain.

District Economics Group

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About ODCA

The mission of the Office of the District of Columbia Auditor (ODCA) is to support the Council of the District of Columbia by making sound recommendations that improve the effectiveness, efficiency, and accountability of the District government.

To fulfill our mission, we conduct performance audits, non-audit reviews, and revenue certifications. The residents of the District of Columbia are one of our primary customers and we strive to keep the residents of the District of Columbia informed on how their government is operating and how their tax money is being spent.

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