

BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM

DIVISION OF RESERVE BANK OPERATIONS AND PAYMENT SYSTEMS

2016 Currency Budget

Action

On December 16, 2015, the Board approved the 2016 currency budget totaling \$737.4 million, which represents an increase of \$19.4 million, or 2.7 percent, from the approved 2015 budget, and an increase of \$44.8 million, or 6.5 percent, from estimated 2015 expenses.

Discussion

Under authority delegated by the Board, the director of the Division of Reserve Bank Operations and Payment Systems (RBOPS) submits an annual fiscal year (FY) print order for new currency to the director of the Bureau of Engraving and Printing (BEP).¹ Upon reviewing the order, the BEP estimates printing costs for new currency during the calendar year (CY), which staff uses to prepare the annual currency budget. The Board then reviews and approves the final budget. Printing costs for Federal Reserve notes constitute about 90 percent of the currency budget. Expenses for currency transportation, the currency quality assurance (CQA) and counterfeit-deterrence programs, the new BEP facility, the currency reader program, other costs to reimburse the BEP, and the currency education program (CEP) make up the remaining 10 percent.

Once the Board approves the currency budget, it assesses the costs of currency to each Federal Reserve Bank on a monthly basis. Table 1 provides details on the Board's CY 2015 budget, 2015 estimate, and 2016 budget.

¹ For more information about the Board's annual print order for new currency please refer to [the Board's public website](#).

Table 1
Currency budget
(calendar year)

	2015 Budget (thousands)	2015 Estimate (thousands)	Percent change 2015E/2015B	2016 Budget (thousands)	Percent change	
					2016B/2015B	2016B/2015E
Print order (number of notes)^a	7,248,952	7,083,216	-2.3	7,841,005	8.2	10.7
\$1 and \$2 notes	2,483,029	2,393,600	-3.6	2,543,890	2.5	6.3
\$5 notes	715,064	736,000	2.9	863,750	20.8	17.4
\$10 notes	602,580	556,800	-7.6	551,680	-8.4	-0.9
\$20 and \$50 notes	1,937,721	1,878,400	-3.1	2,320,084	19.7	23.5
\$100 notes	1,371,200	1,237,004	-9.8	960,000	-30.0	-22.4
\$100 (SNI) notes	139,359	281,412	101.9	601,600	331.7	113.8
BEP expenses	\$663,321	\$646,441	-2.5	\$688,132	3.7	6.4
Printing Federal Reserve notes	\$642,527	\$638,007	-0.7	\$670,422	4.3	5.1
Currency reader	\$17,120	\$4,552	-73.4	\$8,478	-50.5	86.3
Other ^b	\$3,674	\$3,882	5.7	\$4,232	15.2	9.0
New BEP facility	\$0	\$0	N/A	\$5,000	N/A	N/A
Board expenses	\$54,618	\$46,159	-15.5	\$49,245	-9.8	6.7
Currency transportation	\$29,235	\$24,082	-17.6	\$26,400	-9.7	9.6
Quality assurance and counterfeit deterrence research	\$20,993	\$19,576	-6.7	\$19,445	-7.4	-0.7
Currency education	\$4,390	\$2,500	-43.1	\$3,400	-22.6	36.0
Total expenses	\$717,939	\$692,599	-3.5	\$737,377	2.7	6.5

^a The 2016 print order estimate includes approximately 0.6 billion \$100 notes that the BEP estimates it will reclaim using single-note inspection (SNI) equipment. During 2010, the BEP produced 1.1 billion \$100 notes that the Board did not accept because the BEP could not verify that the notes met quality standards; however, the BEP assessed the Board surcharges to cover its costs to produce these notes. The BEP estimates that during 2016, it will process these notes and that approximately 0.6 billion notes will meet the quality standards; however, because the BEP already charged the Board for the variable cost of production for these notes in 2010, it will not charge the Board when it delivers the good-quality notes it reclaims from SNI processing. The BEP has included the labor costs associated with processing these notes as fixed costs and allocated them to the cost of production for all denominations printed. These SNI notes will allow the Board to avoid an estimated \$45 million in variable printing costs.

^b Other BEP expenses include costs to reimburse the BEP for expenses incurred by its Destruction Standards and Compliance Division of the Office of Compliance and Mutilated Currency Division of the Office of Financial Management.

2015 Currency Expenses

Staff estimates that total currency expenses will be \$692.6 million in 2015, which is approximately \$25.3 million, or 3.5 percent, below the 2015 budgeted amount. Nearly half of the budget underrun is attributable to the BEP purchasing fewer currency readers than budgeted. The remainder of the budget underrun is primarily attributable to lower-than-projected costs for transporting new and fit notes, as well as lower printing costs resulting from lower-than-

projected deliveries from the BEP of Federal Reserve notes. These factors are discussed in more detail below.

2015 Printing and Transportation Expenses

Estimated expenses for printing Federal Reserve notes in CY 2015 are \$638.0 million, which is \$4.5 million, or 0.7 percent, lower than the budgeted amount. This budget underrun does not reflect a change to the annual print order or less-than-planned deliveries by the BEP, but rather a shift of deliveries between budget years. The BEP delivered and the Board paid for 0.2 billion notes in the last quarter of CY 2014 (after we submitted the CY 2015 budget) that we had budgeted to be delivered and paid for in CY 2015.²

Because we received fewer notes than we budgeted, we also shipped fewer notes than we projected in the 2015 budget. Currency transportation expenses are estimated to be \$24.1 million, which is \$5.2 million, or 17.6 percent, lower than the budgeted amount of \$29.2 million.

2015 Currency Reader Program Expenses

Estimated CY 2015 expenses for the currency reader program are \$4.6 million, which is \$12.4 million, or 73.4 percent, lower than the budgeted amount primarily because the BEP procured and distributed fewer readers than it estimated. When we prepared the 2015 budget, the BEP estimated that it would procure and distribute 250,000 readers in 2015; however, the BEP currently estimates that it will procure and distribute about 57,000 readers.³ The BEP distributed fewer readers than it budgeted because some potential users have downloaded the BEP's smart-phone currency reader application, instead of ordering a currency reader. The BEP also indicated that it conducted less outreach promoting the availability of the currency reader than it planned.

2015 Currency Quality Assurance and Counterfeit-Deterrence Expenses

Estimated CY 2015 expenses for the CQA and counterfeit deterrence programs are \$19.6 million, which is \$1.4 million, or 6.7 percent, lower than the budgeted amount

² The BEP fulfilled the fiscal year 2015 print order; however, the BEP operates on a fiscal year that begins on October 1 and ends September 30. This difference in timing requires that we estimate the Board's calendar-year budget for new currency by eliminating the estimated volume and associated printing costs of notes that the BEP will produce in the first quarter of its fiscal year and estimating the volume and associated printing costs of notes Board staff projects the BEP will produce in the fourth quarter of the calendar year.

³ The BEP implemented the currency reader program in 2014 to comply with a court order that required the Treasury Department to provide meaningful access to individuals who are blind or visually impaired in denominating U.S. currency.

primarily because some work related to security feature development that we expected to occur in 2015 will occur in 2016 instead.

During 2015, the Board staff and CQA consultants continued to build on the improved processes established to date. During 2015, the consultants helped the BEP establish a sampling program and standards for processing \$100 notes using single note inspection equipment (SNI). The CQA consultants also assisted the BEP in improving the banknote development process so that production quality is considered at the conceptual stage and continues through the development and testing stages of designing the next family of notes. The banknote development process has guided the BEP's development of a new test note, which will be used to test potential new security features and the tactile feature for the next design family of notes.⁴ Additionally, Board staff and the CQA consultants helped the BEP develop an initial integrated master schedule to manage resources and schedules for the next design family of notes.

2015 Currency Education Program Expenses

Estimated CY 2015 expenses for the currency education program (CEP) are \$2.5 million, which is \$1.9 million, or 43 percent, lower than the 2015 budget. This budget underrun is largely attributable to lower-than-budgeted the fulfillment of hard-copy materials, as the program has worked hard to shift the public towards using digital educational tools, which are significantly less expensive to provide. The CEP also transitioned to lower-cost web-hosting services, which resulted in additional savings.

2016 Currency Budget

The proposed 2016 currency budget is \$737.4 million, which is \$19.4 million, or 2.7 percent, higher than the 2015 budget, and 6.5 percent higher than 2015 estimated expenses.⁵ The budget-to-budget increase is primarily attributable to higher printing costs and potential expenses associated with initial contracts for construction management services and facility design for a new BEP facility in the metropolitan Washington, D.C. area. The increase in budgeted printing costs is primarily attributable to the BEP including additional funding for

⁴ The new test note was developed using the newly established banknote development process, which incorporates the functional, security, and manufacturing requirements into the design. The test note is the primary vehicle to test new security features and production processes for possible inclusion in the next family of notes, and to identify early potential manufacturing challenges.

⁵ The attachment shows the new currency expenses, the value and number of notes printed, and the number and cost of notes printed from the 1996 through 2016 budget periods.

research and development efforts in 2016 associated with security and tactile feature development for the next design family of notes.

2016 Printing Budget

The currency budget includes \$670.4 million in printing costs for CY 2016, which represents an increase of 4.3 percent from the 2015 budget and 5.1 percent from 2015 estimated expenses. The printing budget includes \$397.2 million (59 percent) in fixed costs and \$273.2 million (41 percent) in variable costs.⁶

Fixed Costs

Fixed costs, which include capital, prepress and engraving, fixed manufacturing overhead and support, research and development, and general and administrative staff, are budgeted to increase \$23.5 million, or 6.3 percent, from 2015 estimated expenses, primarily because the BEP included an additional \$14 million to support research and development efforts for new security features and a tactile feature for the next design family of notes. The remainder of the increase is primarily attributable to an adjustment to the BEP's working capital fund. For budget planning purposes, the BEP also provided us with a three-year working capital plan that includes nearly \$156 million for anticipated 2016 capital investments and obligations. During 2015, we worked closely with the BEP to review capital projects that exceeded \$1 million.⁷ During 2016, we will collaborate with the BEP to develop a long-term manufacturing strategy and the equipment purchases that will be required to support this strategy. Until that long-term strategy is in place, however, the BEP will continue to seek our approval of all equipment acquisitions in excess of \$1 million.

Variable Costs

Variable costs, which include paper, ink, direct labor, and other variable manufacturing costs, are budgeted to increase by \$8.9 million, or 3.4 percent, from 2015 estimated expenses primarily because of higher paper costs. The BEP recently signed a new contract with Crane, its paper manufacturer, and the new contract includes more robust and

⁶ The BEP does not receive federal appropriations. All operations of the BEP are financed by a revolving fund that is reimbursed through product sales, virtually all of which are sales of Federal Reserve notes to the Board to fulfill its print order. The BEP recovers its costs of operations and obtains funds necessary for capital investment through customer billing rates. Section 16 of the Federal Reserve Act requires that all costs incurred for the issuing of notes shall be paid for by the Board and included in its assessments to the Reserve Banks.

⁷ By memorandum of understanding between the Board and the Treasury, the BEP is required to consult with the RBOPS director before funds are committed for capital projects that exceed \$1 million.

stringent specifications for the paper, to reduce variation and contaminants with the paper, which should lead to lower spoilage of finished notes.

Table 2
BEP Printing Costs

Note type ^a	2015 estimated variable unit costs (per thousand notes)	2016 budgeted variable unit costs (per thousand notes)	2015 estimated total unit cost ^b (per thousand notes)	2016 budgeted total unit costs ^b (per thousand notes)
\$1, \$2	\$18.33	\$20.93	\$54.09	\$54.57
\$5	\$35.80	\$37.54	\$101.37	\$108.75
\$10	\$34.77	\$37.52	\$91.81	\$99.42
\$20, \$50	\$38.16	\$40.95	\$102.07	\$105.73
\$100	\$68.25	\$74.84	\$130.89	\$143.23
\$100 (SNI) ^c	\$66.06	\$0.00	\$66.06	\$0.00
Average cost per thousand notes ^d	\$37.31	\$37.74	\$90.07	\$92.61

a. \$1 and \$2 notes do not include the security features that are in all other denominations; \$5 notes include two watermarks and additional security features; and \$10, \$20, and \$50 notes include watermarks, additional security features, and a new color-shifting ink. The \$100 note includes a watermark, a 3-D security ribbon, a new color-shifting feature (“the Bell in the Inkwell”), additional security features, and a new color-shifting ink.

b. The total costs per thousand notes are fixed costs divided by the number of notes in the Board’s budget, plus variable costs per thousand notes.

c. In 2015, the BEP processed through SNI equipment, \$100 notes it produced in 2014 that the Board did not accept or pay for because of quality concerns. The 2015 estimated variable unit cost for these notes was the BEP’s variable cost of production in 2014. In 2016, the BEP plans to process through SNI equipment \$100 notes it produced in 2010, but the Board did not accept because of quality concerns. Because the BEP recovered expenses associated with producing these notes through surcharges to the Board in 2010, there are no additional printing costs associated with these notes in 2016. Labor costs associated with SNI processing in 2015 and 2016 are included in the BEP’s general and administrative overhead costs and allocated to the fixed costs of all denominations printed.

d. The average cost per thousand notes for 2016 is budgeted costs divided by the number of notes included in the CY 2016 budget, excluding the 0.6 billion SNI \$100 notes the BEP estimates it will deliver. For 2015, the average cost per thousand notes is estimated costs divided by the number of notes included in the CY 2015 estimate.

The BEP provided us with estimates of 2016 printing costs, as shown in table 2, which reflect the number of notes in our order. Variable costs, by denomination, increased slightly between 2015 and 2016 for most denominations because of higher costs for paper and range from \$20.93 per thousand notes for \$1 notes to \$74.84 per thousand notes for \$100 notes. Despite the increases in variable costs by denomination, the average variable costs remained relatively unchanged from 2015 to 2016 because the share of more-expensive \$100 notes decreased from about 18 percent in CY 2015 to about 12 percent in CY 2016.⁸ The total

⁸ If the BEP is unable to deliver the planned 0.6 billion \$100 notes from SNI processing, it will have to produce an offsetting volume of new notes to fulfill the Board’s order, which will result in higher printing costs. We are currently analyzing a sample of the notes processed through SNI and have found that some of the notes contain creasing and do not meet quality standards. We are working with the BEP to develop additional sorting requirements to minimize the number and severity of creased notes that may enter circulation.

projected average cost per thousand notes will increase from \$90.07 in 2015 to \$92.61 in 2016 primarily because of higher fixed costs at the BEP.

2016 Currency Reader Program Budget

The 2016 currency reader budget is \$8.5 million, which is approximately \$3.9 million higher than 2015 estimated expenses and \$8.6 million lower than the 2015 budget. The budget includes \$6.5 million to purchase and distribute over 130,000 currency readers to qualified individuals who are blind or visually impaired at no cost to the user. In addition, the budget includes \$1.5 million to reimburse the Library of Congress for administering the program through the existing infrastructure of its book reader program, which is managed by the National Library Service. The BEP will continue to bill the Board quarterly based on actual, rather than budgeted, expenses.

2016 Budget for Other Reimbursements to the Bureau of Engraving and Printing

The 2016 budget includes \$4.2 million to reimburse the BEP for expenses incurred by its Destruction Standards and Compliance Division of the Office of Compliance (OC) and Mutilated Currency Division (MCD) of the Office of Financial Management. The OC develops standards for cancellation and destruction of unfit currency and for note accountability at the Reserve Banks, and reviews Reserve Banks' cash operations for compliance with its standards. As a public service, the MCD also processes claims for the redemption of damaged or mutilated currency.

2016 Budget for the BEP's New Facility

The 2016 budget includes \$5.0 million for estimated contractual expenses related to initial work for the BEP's new facility. In 2015, the BEP received approval from Treasury to pursue a new building in the metropolitan Washington, D.C. area. The General Services Administration has considered and evaluated several sites and in 2016 the BEP expects to select a site and begin design work. The BEP will bill the Board quarterly for actual expenses related to this program. The BEP included approximately \$40 million in its budget submission to Treasury and asked the Board to include \$10 million in the 2016 currency budget; however, based on the current status of the project, we have included only \$5.0 million in the 2016 budget.

2016 Currency Transportation Budget

The 2016 currency transportation budget is \$26.4 million, which is nearly \$2.3 million, or 9.6 percent, higher than 2015 estimated expenses. The budget includes the cost of shipping new currency from the BEP to Reserve Banks, of intra-System shipments of fit and unprocessed currency, and of returning currency pallets from the Reserve Banks to the BEP. We estimate that we will ship more notes in 2016 than we shipped in 2015 because our CY 2016 budget includes nearly 8.6 percent more notes than the CY 2015 estimate and armored carrier rates increased by about three percent between 2015 and 2016; which is less than historical increases of six percent.

2016 Currency Quality Assurance and Counterfeit-Deterrence Research Budget

The 2016 budget for CQA and counterfeit-deterrence is \$19.4 million, which is about \$0.02 million, or 0.9 percent, lower than 2015 estimated expenses and about 7.4 percent lower than the 2015 budget. The budget includes \$9.2 million to fund the CQA program and \$10.2 million to fund counterfeit-deterrence research and projects, including initial expenses associated with hosting the XXII Pacific Rim Banknote Conference in 2017.

Currency Quality Assurance

The budgeted amount of \$9.2 million for the CQA program is \$5.4 million, or 37.2 percent, lower than 2015 estimated expenses and 33.8 percent lower than the 2015 budget. The budgeted funding will allow the CQA consultants to continue facilitating the implementation of the new quality system at the BEP; to support the research, technology, and product development required for the next design family of notes; and to continue providing temporary resources to the BEP to sustain critical programs that have been implemented for the quality system. In December 2014, the committee agreed to a new contract to continue the CQA program in 2015 and four additional option years.

During 2016, we expect to reduce the number of consultants assigned to support critical functions at the BEP as the quality system matures and BEP staff become more capable of sustaining critical programs. The Board and CQA consultants will continue to build on the improved processes established to date and efforts will continue to focus on several BEP operational areas to derive and sustain improvements in both quality and efficiency.

Counterfeit-Deterrence

The 2016 budget for counterfeit-deterrence research is \$10.2 million, which is nearly \$5.3 million, or 107.6 percent, higher than 2015 estimated expenses and \$3.2 million, or 44.4 percent higher than the 2015 budget. Staff from the Board and BEP are working collaboratively to identify, develop, and integrate new security features into the next design. Security feature development activities that were budgeted to cost \$2.0 million and occur in 2015 have been moved to 2016, and we have included an additional \$3.0 million to contract with national laboratories to perform adversarial analysis on security features under development at the BEP, to conduct additional research on potential security features for the next design family of notes, and to conduct a perception study to assess how consumers use security features to inform the effective integration of security features into the next design.

The budget also includes about \$5.1 million for membership in the Central Bank Counterfeit Deterrence Group (CBCDG). The CBCDG operates under the auspices of the G-10 central bank governors to combat digital counterfeiting and includes 34 central banks. The Board's counterfeit-deterrence budget also includes membership in the Reprographic Research Center to perform adversarial analysis on design concepts and potential security features.

2017 Pacific Rim Banknote Conference

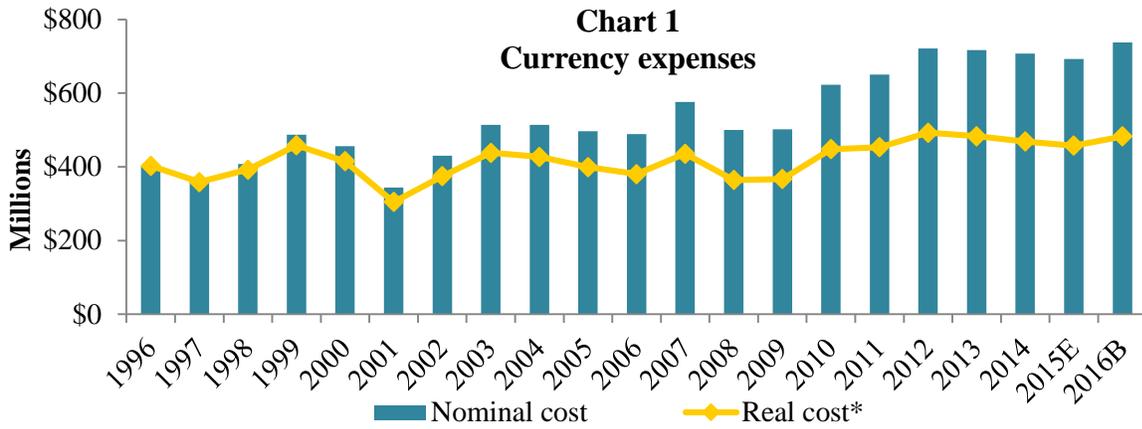
The budget includes \$50 thousand for 2016 expenses associated with hosting the XXII Pacific Rim Banknote Conference in 2017. As head of delegation, the Board will chair the XXII Pacific Rim Banknote Conference, which will be held in San Francisco. Based on previous host country expenses and the Board's expenses associated with hosting the Center for Latin American Monetary Studies (CEMLA) governors' conference in 2013, we anticipate total expenses not to exceed \$200,000 to host representatives from about 16 countries for the three-and-a-half day conference. The 2016 budget will fund development efforts, reservation fees, and other initial expenses. The Board and BEP will equally share all conference hosting costs and contribute staff resources to prepare for the 2017 meeting.

2016 Currency Education Program Budget

The 2016 CEP budget is \$3.4 million, which is \$1.0 million, or 23 percent, lower than the 2015 budget. The CEP program is designed to protect and maintain confidence in U.S. currency worldwide by providing information on all circulating designs of Federal Reserve notes to the global public and key stakeholder groups.

In 2016, the CEP will continue to use in-house resources while leveraging, whenever possible, existing Reserve Bank, United States Secret Service, and State Department partnerships to minimize expenses. Tasks that cannot be sourced internally, or are too resource-intensive, will be contracted; these tasks account for more than 90 percent of the 2016 CEP budget. The major expense drivers for the 2016 budget are outreach to domestic and international businesses and retailers and developing and maintaining the uscurrency.gov educational website.

Attachment: New Currency Expenses



*Real cost is nominal cost deflated by CPIU, normalized to 1996, seasonally adjusted

