

**UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA**

AMERICAN COUNCIL OF THE BLIND, et al.,)

Plaintiffs,)

v.)

JOHN W. SNOW, Secretary of the Treasury,)

Defendant.)

CIVIL ACTION NO.
1:02CV00864 JR

PLAINTIFF’S MOTION FOR SUMMARY JUDGMENT

Pursuant to Rule 56 (a) of the Federal Rules of Civil Procedure, Plaintiffs move for summary judgment on the basis that there is no genuine issue as to any material fact, and Plaintiff is entitled to judgment as a matter of law. The reasons for this motion are fully set forth in the accompanying Memorandum of Points and Authorities. Plaintiff further requests an opportunity to present oral argument in this matter. A proposed Order is attached.

Respectfully submitted,

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**MEMORANDUM OF POINTS AND AUTHORITIES IN SUPPORT OF
PLAINTIFF'S MOTION FOR SUMMARY JUDGMENT**

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**MEMORANDUM OF POINTS AND AUTHORITIES IN SUPPORT OF
PLAINTIFF'S MOTION FOR SUMMARY JUDGMENT**

I. INTRODUCTION & BACKGROUND

On May 6, 2002, Plaintiffs filed a Complaint seeking declaratory and injunctive relief under the provisions of Section 504 of the Rehabilitation Act of 1973, 29 U.S.C. § 794. Pursuant to this provision, individuals with disabilities may not be excluded from or denied the benefits of participation in any program or activity conducted by the United States government. See 29 U.S.C. § 794(a). The Complaint asserted that U.S. banknotes are identical in size and feel, and virtually identical in color. The banknotes provide no basis whatsoever for denominating by blind persons. Moreover, banknotes contain minimal cues to assist persons with low vision in distinguishing between denominations. Disabled Americans experience considerable difficulty in conducting commercial transactions, and purchasing goods and services, as a result of the design of U.S. banknotes.

On August 29, 2002, Defendant filed a Motion for Summary Judgment under Rule 56 of the Federal Rules of Civil Procedure. Defendant asserted that the design of currency was subject to the sole discretion of the Secretary pursuant to 12 U.S.C. § 418, and also that modifying U.S. currency to accommodate the needs of the disabled would be unduly burdensome. The Court denied this motion by Memorandum Order dated April 1, 2003. The Court held that the record was insufficient to determine whether the modifications sought by Plaintiffs would impose an undue burden upon Defendant, and further that Defendant had failed to support its argument that the design of currency was not subject to the provisions of the Rehabilitation Act.

On May 28, 2003, Defendant submitted a Motion to Dismiss under Rule 12 of the Federal Rules of Civil Procedure. Defendant argued that the Secretary's responsibility under the Federal Reserve Act to design currency in the best manner to guard against counterfeiting overrides the general anti-discrimination provisions of the Rehabilitation Act. Defendant also argued that no actionable discrimination existed because the visually disabled have meaningful ability to use currency. Additionally, Defendant asserted that the complaint should be dismissed under the doctrine of failure to exhaust administrative remedies.

On March 31, 2004, the Court denied the Defendant's Motion to Dismiss. American Council of the Blind v. Snow, 311 F.Supp. 2d 86 (D.D.C 2004). The Court ruled that there is no apparent conflict between the Secretary's responsibilities under Section 504, and the Secretary's responsibilities under the Federal Reserve Act. Id at 87. The Court further ruled that the Complaint sufficiently alleges that the Plaintiffs are "disproportionately burdened by the current form of the currency and that this burden may constitute denial of meaningful access." Id. at 89. The Court held that the inquiry beyond this point demands an "examination of the relative burdens of the handicapped and the entity administering the program." Id. Finally, the Court held that exhaustion of administrative remedies would be futile and therefore not be required. Id. at 90.

II. THE BURDEN IS UPON DEFENDANT TO DEMONSTRATE THAT ACCOMODATIONS FOR THE DISABLED ARE UNDULY BURDENSOME

The burden is upon the agency to prove that compliance with the requirements of Section 504 would result in an undue burden upon the agency. The Department of Treasury regulations implementing Section 504 state in pertinent part as follows:

In those circumstances where agency personnel believe that the proposed action would fundamentally alter the program or activity or would result in undue financial and administrative burdens, the agency has the burden of proving that compliance with the § 17.150(a) would result in such alteration or burdens. This determination may be made only after the agency considers all of the resources which it has available to operate the program or activity.

See 31 C.F.R. § 17.150(a)(2).

The Supreme Court has held that agency regulations implementing Section 504 are a particularly important source of guidance in interpreting the Act. Consolidated Rail Corporation v. Darrone, 465 U.S. 624, 634 (1984) (noting that the responsible congressional committees participated in the formulation and adoption of these regulations). Therefore, appropriate deference to agency regulations mandates that the Defendant demonstrate that any accommodations sought by Plaintiff are unduly burdensome.

III. DEFENDANT HAS NOT MADE A REASONABLE EFFORT TO ACCOMMODATE THE DISABLED IN DESIGNING BANKNOTES.

Section 504 requires that the agency make a reasonable effort to accommodate individuals with disabilities. See 31 C.F.R. § 17.150. See also Nathanson v. Medical College of Pennsylvania, 926 F.2d 1368, 1385 (3rd Cir. 1991). However, the record is abundantly clear that the Defendant has not made a good faith effort to accommodate individuals with disabilities in the design of currency. This is evidenced by Defendant's failure to implement the recommendation of the government's own studies which have examined this issue in considerable detail.

A. RECOMMENDATIONS MADE BY THE 1983 AND 1995 CURRENCY STUDIES

In 1983, the Bureau of Engraving and Printing (“BEP”) conducted a study pertaining to the inclusion of accessibility features in banknotes. This study was prepared by the BEP at the request of the Chairman of the House Select Committee on Aging. The results of this study are reflected in a draft report entitled "A Study of Mechanisms for the Denomination of Currency by the Blind or Visually Impaired", dated August 24, 1983, (hereinafter referred to as the “1983 Study”, and attached hereto as Exhibit P-1).

The 1983 Study reviewed a variety of approaches to make banknotes accessible to the visually disabled. The conclusion of the 1983 Study was that varying the size of banknotes by denomination would constitute the most effective method of making banknotes accessible to persons with visual disabilities. However, the 1983 Study recommended against this approach primarily for cost reasons. Instead, the 1983 Study recommended that BEP seek funding for the development of a sophisticated portable electronic device which could be used by the visually disabled to denominate banknotes. See Exhibit P-1, 1983 Study at pp. 5-6.

The issue of banknote denomination by individuals with blindness or low vision was thoroughly addressed in a 1995 study by the National Academy of Sciences (hereinafter referred to as the “NAS Panel” or “NAS Study”, and attached hereto as Exhibit P-2).¹ This study, entitled Currency Features for Visually Disabled People, is by far the most comprehensive examination to date on the subject. The National Academy

¹ Exhibit P-2 is divided into two parts to accommodate the Court’s 1.5 mb limit under ECF. Part I starts from the beginning through page 78. Part II continues from page 79 through the end of the document.

of Sciences (NAS) was chartered by Congress in 1863 to provide advice to the federal government in the scientific, medical, and engineering disciplines.

The NAS Panel was commissioned by the Bureau of Engraving and Printing to analyze and make recommendations concerning currency features which could be useful to the visually impaired. Panel participants included leading experts in the fields of advanced reprographic technology, materials science, substrate materials, banknote production and currency design, psychophysics, optical engineering, chemical engineering, optics and physics, as well as leading experts in low vision and blindness research. The Panel also invited presentations by experts in the fields of visual and tactile perception, as well as representatives from organizations of the visually impaired. See Exhibit P-2, Preface to NAS Study.

The NAS Panel recommended that Defendant include the following features in near term (1-3 years) currency redesigns: (a) variation in both height and length of banknotes; (b) use of large, high contrast denomination numerals on a uniform background; (c) use of different predominant colors for each denomination; and (d) use of denominational UPC coding which could be used by external devices in denominating currency. Additionally, the NAS Panel recommended that the specifications for these new features should strive for sufficient differentiation between denominations to permit rapid, effortless performance. See Exhibit P-2, NAS Study, at pp. 4-5, 75-76. The NAS Panel found that each of the above features could be incorporated based on technologies which are already known and widely used. Id. at pp. 68-70.

1. NAS Panel Recommendations on Varying Banknote Size by Denomination

As noted above, the Panel determined that varying banknote size by denomination was readily achievable within a three year period based on existing technology. See Exhibit P-2, NAS Study, at pp. 68-70. The NAS Panel noted that banknote size varies with denomination in over 120 countries, and that the technology for accomplishing this change is currently in existence. Id., at p. 40. The Panel also found that this feature is generally considered very useful by the visually impaired. Id. at pp. 40-44. The Panel cited to studies which indicate that variation of at least 5-7mm in both length and height of the banknote results in users achieving a 90% success rate with only 30 minutes of learning. Id. at p. 42. As noted below, the different denominations of the Euro vary between 5-7 mm in both length and height.

2. Recommendations of the NAS Panel on Use of Large High Contrast Numerals

The NAS Panel found that use of a large high contrast numeral would require minimal additional capital investment. See Exhibit P-2, NAS Study, at p. 69. The Panel recommended implementation of this feature within 1-3 years. Id. at pp. 4, 68-70. The Panel stated that people with acuity as low as 20/240 could be assisted if the numeral were 60 percent of the current note height. Id. at p. 46. People with acuity at the range of 20/160 would be assisted if the numeral were at least 40 percent of banknote height. Id.

3. NAS Panel Findings on Use of Different Colors for each Denomination

The NAS Panel found that use of different predominant colors for each denomination, like the inclusion of large denomination numerals, would be relatively inexpensive to implement with little or no additional capital investment. See Exhibit P-2, NAS Study, at p. 70. The Panel determined that enough research currently exists to allow experts to identify the primary colors which would be most useful to the visually

impaired in facilitating denomination. Id. at p. 47. The Panel recommended near term (1-3) year implementation of this feature. Id. at pp. 4, 68-70.

4. Recommendations of the NAS Panel for Future Research

The NAS Panel also recommended that Defendant pursue a broad research agenda, with a view towards identifying potential combinations of features which could be employed to enhance denomination. Specifically, the NAS Panel recommended that “high priority” research be conducted to determine “optimum dimensions, optical contrast, location, colors, physical size” for making recognition and denomination of U.S. banknotes easy and convenient for visually disabled individuals. See Exhibit P-2, NAS Study, at pp. 65, 76.

Additionally, the NAS Panel recommended “near or mid-term research” to determine the gradations which will permit reliable human discrimination of low-relief tactile features. Id., at p. 65. See also pp. 5, 76. The NAS Panel urged Defendant to conduct research into the development of durable tactile features. See Exhibit P-2, NAS Study, at pp. 5, 59, 62, 63, 86. The NAS Panel also recommended that Defendant work with device developers to develop improved external devices which could be useful to the visually impaired. Id. at pp. 76. Further, the Panel recommended that Defendant involve appropriate user groups as early as possible to ensure selection of those features which would be most useful to the disabled population. Id. at pp. 6, 77.

B. DEFENDANT’S FAILURE TO IMPLEMENT THE RECOMMENDATIONS CONTAINED IN THE 1983 AND 1995 STUDIES

Defendant has largely ignored the recommendations of the 1983 study and 1995 NAS Panel. The failure of the Defendant to adopt the corrective recommendations

contained in the 1983 study and the 1995 NAS Study demonstrates its unwillingness to meaningfully address the problems of the disabled in dealing with U.S. currency.

The recommendation of the 1983 Study was that Defendant pursue the development of a portable electronic device which would be capable of rapid and accurate denomination. See Exhibit P-1, 1983 Study at pp. 5-6. However, it was not until 2004, after this litigation was commenced, that Defendants took any steps in this direction. Moreover, as will be noted in greater detail below in our discussion pertaining to portable electronic devices, the steps currently taken by Defendant to pursue the development of such a device are half-hearted at best.

Defendant has similarly ignored the recommendations of the NAS Panel. Defendant has not adopted any of the following features which the NAS Panel found could be implemented within a three year period; i.e. (a) use of different predominant colors for each denomination; (b) use of large high contrast denomination numerals; and (c) use of size as a key to denomination. See Exhibit P-2, NAS Study, at pp. 68-70.

1. The Current Use of Color Is Inconsistent With the Recommendations of the NAS Panel

The manner in which Defendant has added color to banknotes is completely inconsistent with the recommendations of the NAS Panel. The NAS Panel recommended the use of a different predominant color for each banknote. See Exhibit P-2, NAS Study at p. 47. The NAS Panel stated that a mix of colors may be helpful from an anti-counterfeiting perspective. However, a mix of colors is not desirable from a denomination standpoint. Id. The Committee also warned that blues and greens should not be used together, as it is particularly difficult to discriminate between these colors. Id.

Notwithstanding the recommendations of the NAS Study, the color scheme adopted by the Defendant relies upon a mix of subtle colors, instead of a single predominant color for each denomination. Background colors of blue and red have been added to the \$50 note. See Exhibit P-3, Reproduction of \$50 and \$20 notes. The \$20 note features background colors of blue, peach, and green. Id. However, the main colors in \$50 and \$20 denominations remain green and black; the other colors are present only in subtle shades in secondary design elements. The BEP website properly describes the background colors on the \$20 and \$50 notes as “subtle.” See Exhibits P-4 and P-5, BEP Description of Color on \$20 and \$50 Notes. This contrasts with the Euro and other currencies, in which the main banknote colors contrast strongly with one another. See Section III(C), *infra*. The present use of color simply does not provide adequate contrast between denominations. See Exhibit P-8, Declaration of Patrick Sheehan, ¶ 10.

2. Design of the Large Denomination Numeral Is Inconsistent With the Recommendations of the NAS Panel

Defendant’s introduction of the larger denomination numeral on the reverse of the \$5, \$10, \$20, and \$50 banknotes is also inconsistent with the recommendations of the NAS Panel. The NAS Panel recommended that the large denomination numeral be at least 40% - 60% of the current banknote height of 66.3 mm, preferably on each side of the banknote. See Exhibit P-2, NAS Study, at p. 46. See also Exhibit P-6, Def. Response to Interrogatory No. 15. Therefore, at a minimum, the large denomination numeral should be 26.52 mm. The NAS Panel also recommended that the large denomination numeral be printed in black ink against a white background, or in white against a black background. See Exhibit P-2, NAS Study at p. 46.

However, the larger denomination numeral on the \$5, \$10, \$20, and \$50 banknotes is 13 mm, or slightly less than 20% of the current banknote height. See Exhibit P-7, Def. Response to Interrogatory No. 12. This is less than half of the size recommended by the NAS Panel. Further, the larger denomination numeral is placed on only one side of the banknote, contrary to the recommendation of the NAS Panel. See Exhibit P-2, NAS Study, at p. 46. See also Exhibit P-9, Declaration of Lorraine Marchi, at ¶7 (recommending larger denomination numeral on both sides of the banknote). Finally, the larger denomination numeral has not been included on the \$1, \$2, and \$100 banknotes.

Moreover, this slightly larger denomination numeral is printed in green, as opposed to black ink, thereby reducing contrast levels. See Exhibit P-8, Declaration of Patrick Sheehan, ¶ 11. See also Exhibit P-9, Declaration of Lorraine Marchi, at ¶ 7. Defendant's sole reason for using green ink is that it is the color traditionally associated with U.S. banknotes. See Exhibit P-10, BEP Explanation for Use of Green Ink. This is an insufficient justification for not providing greater contrast for the larger denomination numeral.

Enclosed is a statement from Lorraine Marchi, Founder and CEO of the National Association of the Visually Handicapped ("NAVH"), an organization founded in 1954 and dedicated to ensuring quality large print materials for people with low vision. See Exhibit P-9, Declaration of Lorraine Marchi. Ms. Marchi states that the contrast in the current large denomination numeral would be improved if its color were changed from the current green to black. *Id.*, at ¶ 7. Ms. Marchi further suggests that the numeral on the bottom right front of the bill should be enlarged, its color should be changed to

provide higher contrast, and a 1mm black outline should be positioned around the number. Id.

3. Defendant Has Not Undertaken Reasonable Efforts To Develop A Portable Electronic Device Capable Of Rapid And Accurate Denomination.

The BEP's 1983 Study evaluated various features which could be used by the visually disabled to denominate currency. The 1983 Study concluded that the most practical solution was to pursue the development of a portable electronic device capable of denominating banknotes. See Exhibit P-1, 1983 Study, at p. 6.

The NAS Panel stated that the preferable approach was to permit the visually disabled to denominate currency without the aid of devices. See Exhibit P-2, NAS Study at p. 63. However, the NAS Panel recommended that the BEP work with device developers to support the development of low cost, highly accurate, and portable electronic devices capable of denominating currency. Id. at p. 71. The NAS Panel noted that devices currently on the market tend to be unreliable, slow, and costly. Id. at p. 25.

The inadequacy of the devices currently on the market is illustrated by the Declaration of Ms. Julia Wilson, a Supervisory Paralegal at the U.S. Department of Justice. See Exhibit P-11, Declaration of Ms. Julia Wilson. Ms. Wilson tested the Brytech Note Teller 2 electronic currency reader. The test results at Table A relates to the newer series of bills (Series 2002 through 2004), and the test results at Table B relate to older series (Series 1981 through 2001). The test results at Table A reveal a 25% error rate, while the test results at Table B reveal a 6% error rate. Id. at ¶5. An error rate of 25%, particularly on the newer series of notes, is beyond any reasonable tolerance. See also Exhibit P-12, Declaration of OurMoneyToo.org, at p. 2 ("electronic bill readers often

do not work with anything but crisp, new bills”); See also Exhibit P-8, Declaration of Patrick Sheehan, at ¶ 12. Ms. Wilson’s Declaration further notes that the retail price of this item is \$270 per unit. See Exhibit P-11, Declaration of Julia Wilson, at ¶ 8.

In August 2004, the BEP issued Request for Quotations (“RFQ”) 04-0687 to industry seeking the development of a pocket sized device with a target retail price of \$35 or less, which could be used to determine the denomination of U.S. currency. See Exhibit P-13, RFQ Specifications. Under the terms of the RFQ, the selected vendor would be provided with up to \$50,000 to develop a prototype of a device which would have an inconclusive read rate of no greater than ten per thousand notes read, and an incorrect read rate of no greater than one per fifty thousand notes read. The successful vendor would have three years after delivery of a working prototype to bring the device to the retail market. If the vendor failed to bring the device to the retail market within the three year time frame, the design would be made public, and other companies would be invited to bring the device to the retail market. Id., at pp. 1, 3. An award incorporating the terms of the RFQ was made to Mnemonics Technologies, Inc., on September 30, 2004. See Exhibit P-7, Def. Response to Interrogatory No. 13.

The assistance given by Defendant to develop a workable prototype comes more than 20 years after the recommendation of the 1983 Study. Plaintiffs believe that such a device may eventually be useful to the visually disabled and to others in both denominating and authenticating banknotes. However, the prototype specifications are inadequate in several significant respects.

First, the ability to rapidly denominate banknotes is an important element of currency transactions. However, the specifications do not specify the response times

which the prototype must be capable of achieving. See Exhibit P-13, RFQ Specifications. Moreover, the specifications require that the prototype be capable of reading banknotes in only two out of four orientations. Id. This is a significant limitation as the visually impaired may be incapable of orienting the banknote to the correct position.

More significantly, there is no assurance that a prototype meeting the specification will be developed. Moreover, even if such a prototype is developed, there is no assurance that the prototype will ever be brought to the retail market. Under the terms of the agreement, the prototype developer has three years to bring the design to the retail market. Id. If the developer fails to achieve this goal, then the design reverts to the public domain, in which case the design may still not be brought to the retail market. Id.

Further, the specifications state that the design “should facilitate the ability to mass-produce the units with a retail target price of less than thirty-five U.S. dollars.” Id. However, the retail price of such a unit depends largely on the size of the market and the number of people willing to purchase the item. Defendant admits that its agreement with the prototype developer “does not establish a ceiling on the sale price of the device to the public” and further that the government “...does not exercise control over the ultimate sale price.” See Exhibit P-14, Def. Admissions No’s 3 & 4. Nor is the Defendant willing to assume any role in marketing the unit, or in developing sales channels for the unit. See Exhibit P-13, RFQ Specifications. at pp. 2-3 (Questions and Answers No’s. 3, 10, 11).

The uncertainty as to the eventual retail price for such an item is a major concern to Plaintiffs. Devices currently on the market, such as the Note Teller 2, sell for

approximately \$270. See Exhibit P-11, Declaration of Julia Wilson, at ¶ 8. Such a price is completely unaffordable for many visually disabled people. A large percentage of the visually impaired are elderly individuals. These persons are often living on fixed incomes. The purchase of such an expensive item is simply beyond their reach.

Most importantly, Defendant states that it will not provide any subsidy to qualified individuals in purchasing the unit. See Exhibit P-13, RFQ Specifications, at pp. 3-4 (Questions & Answers No's 7, 12). Defendant is unwilling to underwrite any portion of the cost of the unit for individuals who may be unable to afford it. Id. There is simply no assurance that the prototype, even if brought to market, would be affordable to the large number of visually impaired individuals with limited economic means.

Finally, development of such a device should not serve as a substitute to permitting the visually disabled to independently denominating banknotes with their own senses. Plaintiff's concur with the NAS Panel that it is preferable to permit the visually disabled to denominate currency without need for external devices. See Exhibit P-2, NAS Study at p. 63.

The purpose of the Rehabilitation Act is to promote the independence of disabled persons, as well as their integration into mainstream society. See 29 U.S.C. § 701(b); J.D. ex rel. J.D. v. Pawlet School Dist. 224 F.3d 60, 70 (2nd Cir. 2000). The regulations implementing Section 504 recognize that government services should be provided to the disabled in the most integrated setting appropriate. 31 C.F.R. § 17.130(d); 31 C.F.R. § 17.150(b). Therefore, the visually disabled should be permitted to denominate currency without being required to carry around an external device. This is critical to allowing the

visually disabled to maintain a sense of independence. See Exhibit P-12, Declaration of OurMoneyToo.org at p. 2.

4. Defendant Has Not Undertaken Any of the Research and Testing Recommended By the NAS Panel

The NAS Panel recommended that Defendant conduct extensive research into features which could be potentially useful to the disabled. The NAS Panel urged that “high priority” research be conducted to determine “optimum dimensions, optical contrast, location, colors, physical size” which could facilitate denomination by the visually disabled. See Exhibit P-2, NAS Study, at pp. 65, 76. The NAS Panel recommended “near or mid-term research” to determine the gradations which will permit reliable human discrimination of low-relief tactile features. Id., at p. 65. See also pp. 5, 76. The Panel further recommended additional research into the development of durable tactile features. Id. at pp. 5, 59, 62, 63, 86.

Defendant has not undertaken any part of the broad research agenda recommended by the NAS Panel. Defendant claims to have conducted research and testing with respect to the following features: (a) inclusion of a large denomination numeral on the reverse side of the banknote; (b) inclusion of an embossed feature currently used on Canadian banknotes; (c) inclusion of a micro-perforation design currently used in Swiss currency, and (d) determination as to optimal color patterns for the visually disabled. See Exhibit P-6, Def. Response to Interrogatories No’s. 14-16. However, there is not even a scintilla of evidence to support Defendant’s claim to have conducted such testing.

For example, Defendant states that it obtained an assessment by the University of Minnesota Laboratory for Low-Vision Research in connection with its design of the larger denomination numeral placed on the reverse side of the \$5 and higher banknotes. See Exhibit P-6, Def Response to Interrogatory No. 15. However, Defendant is unable to locate a copy of this assessment. See Exhibit P-14, Def. Response to Document Production Request No. 19. Indeed, Defendant is not even certain whether the results of this assessment were conveyed orally or in writing. See Exhibit P-15, Letter from Defendant's Counsel dated August 1, 2005.

Defendant claims to have tested an embossed feature which is currently used on Canadian banknotes. See Exhibit P-6, Def. Response to Interrogatory No. 14. Canadian currency incorporates a series of embossed dots which are used by the visually disabled to distinguish between denominations. This embossed feature was tested on ten (10) U.S. banknotes. See Exhibit P-36, Declaration of H.H. Holton, at ¶ 8. Defendant stated that the Canadian feature "was found to have insufficient durability to approximate the average length of time required for Federal Reserve notes to remain in circulation." See Exhibit P-6, Def. Response to Interrogatory No. 14.

Defendant was asked to produce the results of the testing which it conducted to determine the durability of the Canadian feature. See Exhibit P-14, Def. Response to Document Production Request No. 17. In response, Defendant furnished a document entitled "Tactile Feature for the Blind." Id. However, this document reflects only durability testing of the Canadian feature on Canadian banknotes. See Exhibit P-16,

Tactile Feature for the Blind, at pp. 6-7.² Defendant has not produced any test results reflecting upon the durability of the Canadian feature on U.S. banknotes.

A more complete explanation of testing of the Canadian feature on U.S. banknotes is provided by H.H. Holton, President, Payment Systems, Canadian Bank Note Company, Limited. See Exhibit P-36, Declaration of H.H. Holton. The Canadian Bank Note Company developed and patented the Canadian tactile feature, and is one of two companies under contract to print paper currency for the Bank of Canada. Id., at ¶ 3,4.

At the request of Defendant, the Canadian Bank Note Company conducted preliminary wear testing on ten (10) U.S. banknotes using the Canadian formula. After wear testing, the relief provided by the Canadian feature on U.S. banknotes was reduced on average from 110 microns to 20 to 35 microns. Id. at ¶ 8. Based on research conducted by the Canadian Bank Note Company, the 20 to 30 micron range on worn banknotes was rated “satisfactory” by the visually impaired, while a 55 micron height or greater was rated as “very good.” Id.³ The Canadian Bank Note Company states that it is probable that the embossed feature could be applied to U.S. banknotes in a manner which would be useful to the blind. Id. at ¶ 9.

The Holton Declaration clearly refutes Defendant’s assertion that the Canadian feature was found to have insufficient durability on U.S. banknotes. Moreover,

² Exhibit P-16 is divided into three parts to accommodate the Court’s 1.5 mb limit under ECF. The cited reference is contained in Part I.

³ The Canadian Bank Note Company provided these test results to the Defendant. See Exhibit P-36, Declaration of H.H. Holton, at ¶ 8. Plaintiffs Document Production Request No. 17 requested production of all documents reflecting testing of the Canadian feature on U.S. banknotes. See Exhibit P-14. For some unexplained reason, Defendant failed to provide these test results in response to Plaintiffs discovery request. Plaintiff would appreciate an explanation from Defendant concerning this apparent discrepancy.

Defendant's assertion contradicts its own prior statement in which it admits that it is unable to determine the extent to which an embossed feature would reduce the useful life of U.S. banknotes, or even whether such reduction would be significant. See Exhibit P-7, Def. Answer to Interrogatory No. 5. In any event, Defendant could not possibly have reached any conclusions as to the durability of the Canadian feature on the basis of a test sample of ten (10) U.S. banknotes. As noted by the Holton Declaration, sample sizes of 1000 banknotes would normally be required to produce statistically valid conclusions as to durability. Id., at ¶ 10.

Defendant also states that it tested a micro-perforation design developed for use as a security feature in Swiss currency to determine whether it could be useful to the visually disabled. See Exhibit P-33, Copy of Swiss Bank Note. Defendant stated that the presence of the perforation design was detectable by visually impaired persons. However, "the specific patterns could not be identified sufficiently for accurate denomination of currency. An analysis to determine the effectiveness and durability of the feature indicated that the perforation pattern could be altered or simulated easily and that the holes left by perforating accumulated dirt and debris." See Exhibit P-6, Def. Response to Interrogatory No. 14.

Defendant was asked to produce the results of any testing which it conducted to determine the effectiveness and the durability of the micro-perforation feature. See Exhibit P-14, Def. Response to Document Production Request No. 18. In response, Defendant furnished a single page memorandum from Robert Stone to Thomas A. Ferguson, dated September 4, 2002. Id. However, this memorandum merely requests approval to provide twenty blank pieces of U.S. banknote paper to Switzerland for

testing. See Exhibit P-17, Memorandum from Robert Stone to Thomas A. Ferguson, dated September 4, 2002. Defendant has not produced any test results reflecting upon the durability or the effectiveness of the Swiss micro-perforation feature on U.S. banknotes.

Most importantly, Defendant admitted that the presence of the micro-perforation design was detectable by persons with visual disabilities. See Exhibit P-6, Def. Response to Interrogatory No. 14. See also Exhibit P-18, Report Prepared by Deloitte & Touche/Shugoll, at p. 22. Therefore, the micro-perforation method could provide a meaningful denomination cue merely by virtue of its location on the banknote, even if the specific micro-perforation pattern was not itself sufficient to provide denomination information.

Defendant was also asked to describe any testing which it conducted to determine the optimal color schemes which would be useful to the visually disabled. Defendant stated that it contracted with Deloitte & Touche/Shugoll to conduct a research study as to how color may be useful to the visually disabled in denominating currency. See Exhibit P-6, Def. Response to Interrogatory No. 16.

Contrary to Defendant's assertions, the needs of the disabled were not even considered by the Deloitte study. The purpose of the study was to determine public awareness of the design and counterfeit features in the recently redesigned U.S. currency, and to determine the receptivity of the target audiences to various anti-counterfeiting features. See Exhibit P-18, Report Prepared by Deloitte & Touche/Shugoll, June 2002, Executive Summary at p.2.⁴ The target audiences were derived from individuals in the

⁴ Exhibit P-18 is divided into two parts to accommodate the Court's 1.5 mb limit under ECF. Part I starts from the beginning through page 28. Part II continues from page 29 through the end of the document. The Executive Summary is in Part I.

following groups: consumers, bank tellers, cashiers, gaming industry employees, law enforcement officials, and teachers. Id. The study protocols expressly excluded from participation individuals with visual limitations. Id. at Appendix A, pp. 4R, 6C.⁵ This can hardly be a study designed to test the benefits of using color to assist the visually disabled in denominating currency.

Defendant's inability to produce any results of the testing which it states it conducted raises grave doubts as to the good faith of its claim. In each case, Defendant has either lost the test results, is unable to produce any written report reflecting the results of such testing, or produced research results which have no bearing on the needs of the disabled. The obvious conclusion is that Defendant has not performed any research or testing for the purpose of making banknotes more accessible to the visually disabled.

U.S. banknotes are today no more accessible to the visually disabled than 50 years ago. This is not a record which suggests a good faith willingness on the part of the Defendant to make reasonable accommodations for the visually disabled.

Unfortunately, the future does not look any brighter. Defendant's future plans to make banknotes accessible to persons with visual disabilities are limited to the commissioning of another study, the addition of colors to all denominations, and continuing to include a larger denomination numeral on the reverse side of the banknote. See Exhibit P-6, Def. Response to Interrogatory #20.

The conclusions of the 1983 and 1995 studies were well known to Defendant when it conducted its 1996 and 2004 currency redesigns. Nonetheless, Defendant chose

⁵ Appendix A is contained in Part II of Exhibit P-18.

to ignore the recommendations of those studies. There is a little reason to believe that Defendant will treat the results of the new study any differently.

Defendant's statement that it will continue to add color to all denominations is contradicted by the most recent report from its Chief Financial Officer. According to the latter, Defendant has no plans to redesign the \$5 note, and the \$1 and \$2 notes will not be redesigned. See Exhibit P-34, 2004 CFO Report, at p. 7.⁶ In any event, the manner in which Defendant currently employs color is of no benefit to the visually disabled.

C. CURRENCY FEATURES IN USE WORLDWIDE DEMONSTRATE THE FEASIBILITY OF ACCOMMODATING THE VISUALLY DISABLED

The NAS Panel conducted an extensive study of accessibility features in use worldwide. The Panel found that different sized currency is an established practice in over 120 countries. See Exhibit P-2, NAS Study at p. 40. The Panel found that 24 countries have adopted a specific scheme involving the use of large denomination numerals. Id. at p. 102. The Committee found that 167 out of 171 issuing authorities use a clearly differentiated color scheme for all denominations. Id. At the time of the 1995 NAS Study, there were 16 countries that used intaglio printing to produce tactile marks for each denomination. Id., NAS Study at p. 103. Another 7 currencies have tactile features on some denominations. Id.

The Euro was introduced on January 1, 2002. During the development of the Euro, designers and printing experts consulted the European Blind Union. The result was

⁶ Exhibit P-34 is divided into two parts to accommodate the Court's 1.5 mb limit under ECF. Part I starts from the beginning through page 1-. Part II continues from page 11 through the end of the document.

a currency design which incorporates tactile cues, color, large denomination numerals, and different sizes for each denomination.

On the front of each note is a large denomination numeral over 2 centimeters tall, which is set against a pale background. This large denomination numeral is manufactured with intaglio printing, and is designed to be perceptible to touch. See Exhibit P-19, Euro Vision, Understanding Euro Notes and Coins, A Guide for People with Poor Vision, jointly published by the European Blind Union, European Commission, and the European Central Bank, at p. 4.⁷ Specific patterns using intaglio print which are perceptible to touch are also printed along the edges of the EUR 200 and EUR 500 banknotes to help with recognition. These edge patterns are printed using the intaglio method. Id. at p. 5. Additionally, the notes have a foil feature which is also perceptible to touch. The foil feature on the 5, 10, and 20 Euro notes differs in shape and position from the foil feature on the 50, 100, 200, and 500 notes. Id. at p. 6.

The length of the Euro increases by 6-7 mm with each denomination. The smallest note, which is the 5 Euro, is 12 cm long, while the largest note is 16 cm long. The 5, 10, 20, 50, and 100 notes also increase in height. The 5 Euro note is 6.2 cm in height, while the 100 Euro note is 8.2 cm in height. Id. at p. 5.

Moreover, each Euro denomination has a striking dominant color, used on the front and the reverse sides. The dominant colors for each Euro denomination are: 5 Euro – Grey; 10 Euro – Red; 20 Euro – Blue; 50 Euro – Orange; 100 Euro – Olive Green; 200 Euro – Yellow-Brown; 500 Euro – Purple. Id. at p. 6.

⁷ Exhibit P-19 is divided into two parts to accommodate the Court's 1.5 mb limit under ECF. Part I starts from the beginning through page 16. Part II continues from page 17 through the end of the document.

The Canadian currency was redesigned in 2001 after extensive consultation with blind and visually impaired Canadians. The newly redesigned currency incorporates a series of symbols formed by groupings of six raised dots separated by a smooth surface. Each symbol is composed of two columns of three raised dots. These dots are embossed and back-coated to enhance their durability. See Exhibit P-20, Bank of Canada, Description of Accessibility Features.

The number and position of these symbols vary according to the denomination. The \$5 note has one symbol, the \$10 note has two symbols separated by a smooth surface, the new \$20 note has three symbols separated by two smooth surfaces, and the \$50 note has four symbols separated by three smooth surfaces. Like the \$10 note, the new \$100 bank note has two symbols, but the smooth surface between them is wider. Id.

The embossed feature on Canadian currency reflects a unique method of embossing which provides additional durability to the embossed symbols. See Exhibit P-16, Tactile Feature for the Blind, at pp. 3-4. This feature was subject to extensive durability testing prior to its incorporation. Id. at pp. 6-7. The results demonstrate that the embossed feature would not reduce the durability of Canadian banknotes. Id. The relief provided by the embossed symbols is more than adequate to enable rapid denomination. Id., at p. 5. After a few minutes of training, users are able to denominate using the embossed symbol within an average of 13 seconds. Id. The redesigned notes did not present any stacking concerns to the Bank of Canada. Id. at p. 7.

In sum, the United States lags far behind other major countries in accommodating the visually disabled in connection with the design of currency. Plaintiff does not suggest that the United States should copy the design of other currencies. However, this

discussion demonstrates the widespread adoption of features which provide the visually disabled far greater access to currency than presently exists in the United States.

D. THE COSTS OF PROVIDING ACCOMODATIONS TO THE VISUALLY DISABLED ARE NOT UNDULY BURDENSOME

The Court's order denying Defendant's Motion to Dismiss held that Plaintiff's have properly alleged that they are "disproportionately burdened by the current form of the currency and that this burden may constitute denial of meaningful access. The inquiry beyond this point is necessarily fact-specific and demands an examination of the relative burdens of the handicapped and the entity administering the program." American Council of the Blind v. Snow, 311 F.Supp. 2d 86, 89 (D.D.C. 2004).

1. The 1983 BEP and 1995 NAS Panel Analysis of Cost Impacts

The issue of cost is obviously significant in ascertaining the burden imposed upon Defendant. This issue was addressed by the BEP in its 1983 study. The cost impacts of making currency accessible to the visually disabled were summarized in Figure 2 of the BEP study, which is reproduced below. See Exhibit P-1, 1983 Study. This study demonstrates that many of the accessibility features sought by Plaintiff can be achieved at

a relatively modest cost.

Analysis of Proposed Changes to U. S. Currency on Bureau Operations

<u>Option</u>	<u>Aid Visually Impaired</u>	<u>Aid Blind</u>	<u>Increase In Initial Cost</u>	<u>Increase in Annual Costs</u>	<u>Increases in Manufacturing Cost per-thousand Notes</u>	<u>Increase in FTE 1]</u>	<u>Increase in Space (square Feet)</u>
1. Use of intaglio inks in different colors	Yes	No	\$ 470,000	\$ 640,000 2] 1,280,000	\$.13 -.30 2]	16	-
2. Intaglio inks remain unchanged, offset tints would be utilized	Yes	No	2,200,000 2] 12,000,000	3,460,000 2] 9,327,000	.69 -1.86 2]	16 - 72 2]	12,000
3. Change in size of note by denomination	Yes	Yes	25,630,000	6,670,000	1.33	150	36,000
4. Notches or clipped 3] corners	Yes	Yes	2,600,000	1,400,000	.28	29	100
5. Use of braille or braille-like symbols	Somewhat	Somewhat	8,100,000	3,050,000	.61	100	48,000

The issue of cost was also addressed by the NAS Panel. The NAS Panel concluded that at least three of the features which could be useful to the visually disabled, i.e., color, large denomination numeral, and perforations, could be achieved with minimal additional capital expenditures. Exhibit P-2, NAS Study, at pp. 69-70. Moreover, the NAS Panel also found that use of different predominant colors for each denomination, and inclusion of a large denomination numeral, could also be implemented within a 1-3 year period. Id., at pp. 68-70.

2. Defendant's Current Analysis of Cost Impacts

Cost impacts were again addressed by Defendant in responding to Plaintiff's discovery requests during the course of this litigation. Defendant was asked to estimate the total costs involved in adding specific accessibility features to U.S. currency, including research, design, and manufacturing expenses. The following estimates

provided by Defendant reflect the cost of modifying all denominations, including the \$1 note.

Defendant states that adding a large denomination numeral, which is at least 60% of current banknote height, would require a one time outlay of \$4,500,000, plus additional annual costs in the amount of \$400,000. See Exhibit P-7, Def. Response to Interrogatory No. 8. The use of large geometric shapes on banknotes would require a one time outlay of \$4,500,000, with no additional annual costs. See Exhibit P-7, Def. Responses to Interrogatory No. 10. The use of different predominant colors on each banknote would require a one time outlay of \$48,000,000, with additional annual cost in the amount of \$20,000,000. See Exhibit P-7, Def. Response to Interrogatory No. 9. None of these features would have any impact on banknote durability. See Exhibit P-6, Def. Admissions No's 1 and 2.

Defendant estimates that the cost impact of varying the length and height of currency would be \$245 - \$320 million in initial costs. See Exhibit P-21, Declaration of Thomas Ferguson, Director of the Bureau of Engraving and Printing, dated August 28, 2002 (hereinafter the "Ferguson Declaration"), ¶ 52. However, \$70-\$90 million of the initial start up costs is related to public education expenses, as opposed to any cost involved in the production of currency. Id.

The Ferguson Declaration further refers to increased annual expenses in the amount of \$143 - \$174 million related to varying the height and length of banknotes. Id. However, \$92 - \$109 million of the estimated increased annual costs are related to replacing prematurely worn currency. Id. The additional cost of replacing prematurely worn currency would only be incurred if an embossed numeral or tactile feature is

included, in addition to the dimensional changes. See Ferguson Declaration, ¶¶ 49-51. Therefore, the additional annual costs of varying the height and length of banknotes, without also including an embossed numeral, would be \$51 - \$65 million.

Defendant states that the cost to emboss a tactile feature on banknotes would require a one-time outlay of approximately \$45.5 million, plus additional annual costs of \$16,000,000. See Exhibit P-7, Def. Response to Interrogatory No. 5. Defendant states that the total costs to include a micro-perforation feature perceptible to touch would require a one time outlay of \$75 million, plus additional annual costs of \$9 million. See Exhibit P-7, Def. Response to Interrogatory No. 6. Defendant states that the cost of adding a foil feature to banknotes which is perceptible to touch would result in a one-time outlay of \$51.5 million, plus additional annual costs of \$15.3 million, excluding the cost of the foil, which the Defendant declines to estimate. See Exhibit P-6, Def. Response to Interrogatory No. 22.

U.S. currency is currently producing using the intaglio method. See Exhibit P-22, BEP Description of Intaglio Process. However, Defendant declines to estimate the costs of using intaglio printing to create a tactile feature on banknotes because it considers it unlikely that such a feature could be produced. See Exhibit P-6, Def. Response to Interrogatory No. 21.

Defendant's response is incomprehensible given that the Euro uses the intaglio method to create a large denomination numeral which is perceptible to the touch. See Exhibit P-19, Euro Vision, Understanding Euro Notes and Coins, at p. 4. Specific patterns using intaglio print which are perceptible to touch are also printed along the edges of the EUR 200 and EUR 500 banknotes to help with recognition. Id. at p. 5.

Additionally, the Japanese yen also uses intaglio print to incorporate a tactile feature specifically designed to assist the blind in denominating currency. See Exhibit P-32, Bank of Japan Description of Yen Note. At the time of the 1995 NAS Study, there were 23 countries that used intaglio printing to produce tactile marks on currency. See Exhibit P-2, NAS Study at p. 103.

3. Defendant's Cost Estimates are Either Inflated or Unsubstantiated

Defendant's cost estimates are based on the cost of modifying all denominations, including the \$1.00 note. The \$1 note consists of approximately 50% of all currency production. See Exhibit P-21, Ferguson Declaration at ¶5. Defendant asserts that it is precluded from modifying the \$1 note due to legislative restrictions. See Def. Motion for Summary Judgment, at 18. Therefore, the cost estimates provided by Defendant are likely to be significantly reduced if the cost of modifying the \$1 note is subtracted.

Further, these cost estimates are not supported by the documentation furnished by Defendant in support thereof. For example, Defendant asserts that the initial costs to design and engrave an enlarged denomination numeral would be \$4,500,000. However, documents provided by Defendant to support this estimate indicate that the initial cost to design and engrave the larger denomination numeral equals only \$354,544. The latter figure is based upon an estimate of a total of 2,650 engraving hours, at an hourly rate of \$133.79. See Exhibit P-23, Cost Impact of Enlarged Numeral, Def. Response to Third Document Production Request.

Defendant increases its one-time cost estimate from \$354,544 to \$4.5 million solely on the basis of a two sentence email to the BEP legal counsel, which neither explains the increase nor even references a figure of \$4.5 million. See Exhibit P-24, Def.

Response to Document Production Request No's 10-16, Answer No. 12, and Exhibit P-25, email from Len Olijar, dated April 19, 2005. Defendant would be required to expend 33,634 additional engraving hours to design the larger denomination numeral in order to reach an initial outlay cost of \$4.5 million, assuming an hourly rate of \$133.79. It is inconceivable that the design of a larger denomination numeral would require an additional 33,634 engraving hours.

Defendant's cost estimates are unexplained in several other significant respects. For example, Defendant asserts that to emboss currency it will be required to purchase 12 embossing machines at \$3 million each (See Exhibit P-26, Cost Impact of Embossing Feature, Def. Response to Third Document Production Request); to perforate currency it will be required to purchase 12 perforation machines at \$5.5 million each (Exhibit P-27, Cost Impact of Perforation Feature, Def. Response to Third Document Production Request); and to add foil it will be required to purchase 12 foil stamp machines at \$3.5 million each (Exhibit P-28, Cost Impact of Foil Stamp, Def. Response to Third Document Production Request). However, Defendant provides no documentation as to how it arrived at its estimated cost per machine, notwithstanding Plaintiff's request for all documents supporting Defendant's cost estimates. See Exhibit P-24, Def. Response to Document Production Requests No's 10-16.

Defendant states that each new embossing machine will require hiring 2 pressman and 1 KG-4 helper per machine shift (Exhibit P-26, Cost Impact of Embossing Feature); each new perforating machine will require hiring one additional plate printer per machine shift (Exhibit P-27, Cost Impact of Perforation Feature), and each new foil stamp machine will require hiring 2 pressman and 1 KG-4 helper per machine shift (Exhibit P-

28, Cost Impact of Foil Stamp). Once again, Defendant provides no supporting documentation as to how it arrived at its estimated staffing cost per machine.

Finally, Defendant asserts that the addition of different colors for each denomination would require a one time additional equipment cost of \$48 million, plus increased annual costs of \$20 million, primarily for labor. See Exhibit P-7, Def. Response to Interrogatory #9. Documents supporting this estimate reflect that the additional capital costs consist of the purchase of 4 new printing presses at \$12 million each. See Exhibit P-29, Cost Impact of Offset Printing Feature, Def. Response to Third Document Production Request. The increased labor cost consists primarily of the additional labor required to operate each new machine. Id.

Defendant's cost estimates are inconsistent with the findings of the 1995 NAS Panel, which found that little additional capital investment would be required to add color to banknotes. See Exhibit P-2, NAS Study, at p. 70. In any event, Defendant has already added different colors to the \$20 and \$50 notes. See Exhibit P-7, Def. Response to Interrogatory #9. Accordingly, the increased costs reflected above can only consist of the amounts required to add color to the remaining five denominations.

Defendant states that it currently plans to add different background colors to all seven denominations. See Exhibit P-6, Def. Response to Interrogatory #20. Therefore, Defendant will incur the additional costs of adding different colors for each denomination regardless of the outcome of this litigation. The only issue is whether these costs will be incurred to add a color scheme which will provide sufficient contrast to assist the visually disabled in distinguishing between denominations.

4. Defendant's Asserted Cost Impacts Do Not Impose a Substantial Burden, Even Assuming Their Accuracy

Defendant states that it has spent \$4.2 billion over the past 10 years to produce currency. See Exhibit P-7, Def. Response to Interrogatory No. 1. This equates to an average of approximately \$420,000,000 per year. Defendant further states that every aspect of currency production involves the incorporation of anti-counterfeiting features. See Exhibit P-7, Def. Response to Interrogatory No. 2. Therefore, Defendant states that it has spent \$4.2 billion for anti-counterfeiting purposes as well. Id.

The costs of the design changes sought by Plaintiffs are relatively insignificant when compared to the average annual cost for currency production of \$420 million. The use of different predominant colors for each denomination would result in increased annual costs \$20 million (Exhibit P-7, Def. Response to Interrogatory No. 9), which is less than 4.7% of the average annual \$420 million production cost. As discussed above, any additional costs to add color to currency will be incurred in any event given Defendant's plans to add different background colors to all denominations.

The inclusion of an embossed numeral would result in increased annual costs of \$16 million (Exhibit P-7, Def. Response to Interrogatory No. 5), or approximately 3.8% of average annual production costs. Addition of a foil feature would result in increased annual costs of \$15.3 million (Exhibit P-6, Def. Response to Interrogatory No. 22), excluding the cost of the foil itself which Defendant declines to estimate. This annual increase is approximately 3.6% of the average yearly \$420 million production cost. The use of a micro-perforation feature would result in additional annual costs of \$9 million (Exhibit P-7, Def. Response to Interrogatory No. 6), or approximately 2% of average

annual production costs. The inclusion of a large denomination numeral would result in increased annual costs of \$400,000 (Exhibit P-7, Def. Response to Interrogatory No. 8), which is approximately .095 percent, or less than one-tenth of one percent, of the average annual production costs. The use of large geometric shapes on banknotes to indicate denomination would result in no increased annual costs. See Exhibit P-7, Def. Responses to Interrogatory No. 10.

Moreover, the cost increases projected by Defendant are double what would be required if the cost of modifying the \$1 note were excluded. Thus, Defendant calculated the cost increases associated with making the design modifications sought by Plaintiffs on the basis of its costs per 1000 notes. See Exhibit P-23, Cost Impact of Enlarged Numeral; Exhibit P-26, Cost Impact of Embossing Feature; Exhibit P-27, Cost Impact of Perforation Feature, Exhibit P-28, Cost Impact of Foil Stamp; Exhibit P-29, Cost Impact of Offset Printing Feature. However, approximately 50% of the Bureau's production volume consists of the \$1 note. See Exhibit P-21, Ferguson Declaration at ¶5. Therefore, the annual cost increases provided by Defendant in connection with making these design modifications must also be decreased by 50%, assuming that no modifications are made to the \$1 note. Similarly, the initial equipment costs estimated by Defendant must also be proportionately reduced by one-half, as only 50% of the estimated equipment would be required to meet the correspondingly reduced production volumes.

Defendant states that it has already spent approximately \$49 million to make currency accessible to persons with visual disabilities. See Exhibit P-7, Def. Response to Interrogatory No. 4. According to Defendant, these costs were incurred for the purpose of adding color and a large denomination numeral. Id.

Defendant's contention that it added color to currency for the purpose of assisting persons with visual disabilities is highly questionable. Exhibit P-8, Declaration of Patrick Sheehan, ¶ 10. Nonetheless, even assuming the correctness of this assertion, the additional amounts required to make currency truly accessible to persons with visual disabilities are not disproportionate to the sums already expended by Defendant for this purpose.

Defendant states that its cost estimates do not include any reduction in the useful life of currency due to degradation of the embossed numeral or the micro-perforation feature. Defendant states that the reduction in the useful life of banknotes associated with degradation of these features "cannot be determined." See Exhibit P-7, Def. Response to Interrogatories No's. 5, 6. The Ferguson Declaration conceded that no testing has been conducted to determine the extent to which the useful life of a note would be reduced by inclusion of such features. See Exhibit P-21, Ferguson Declaration, ¶ 50.

Defendant's inability to estimate the additional costs due to any potential reduction in the useful life of the currency is due to its own inaction in implementing the recommendations of the 1995 NAS Panel. The NAS Panel urged the Defendant to conduct research into the development of durable tactile features. See Exhibit P-2, NAS Study, at pp. 5, 59, 62, 63, 86. However, this research has not been conducted. Nor has any testing been performed by Defendant to determine the durability of these features. See Exhibit P-21, Ferguson Declaration, ¶50. Accordingly, Plaintiff's are seeking that the Court mandate that Defendant perform such research and testing as may be required for the purpose of developing durable tactile features, and determining the costs associated therewith.

In any event, Defendant's estimates as to the useful life of currency are inconsistent with estimates provided by the Federal Reserve Board. The Director of the BEP stated that a "*on average, a five dollar bill is withdrawn after approximately two years in circulation, a ten dollar bill is withdrawn after approximately 3 years in circulation, a twenty dollar bill is withdrawn after approximately four years in circulation, and both a fifty and a one hundred dollar bill is withdrawn after approximately nine years in circulation.*" See Exhibit P-21, Ferguson Declaration at ¶ 50.

However, the Federal Reserve Board has furnished considerably shorter estimates of the useful life of banknotes. In fact, the Federal Reserve Board's estimate of the useful life of banknotes is approximately 50% of the length estimated by the BEP. The Federal Reserve Board states that the average life of a \$5 note is 16 months, a \$10 note is 18 months, a \$20 note is 24 months, a \$50 note is 55 months, and a \$100 note is 89 months. See Exhibit P-35, Federal Reserve Board FAQ.

Defendant has repeatedly asserted that the accommodations sought by Plaintiffs would compromise the useful life of banknotes. See e.g., Exhibit P-6, Def. Response to Interrogatory No. 14 (the Canadian embossing feature "was found to have insufficient durability to approximate the average length of time required for Federal Reserve notes to remain in circulation"). These assertions must be treated with considerable skepticism given the wide variations between the estimates of the BEP and the Federal Reserve Board as to the useful life of banknotes.

The regulations promulgated by the Secretary of the Treasury implementing Section 504 state that the existence of an undue burden must be considered in light of "all agency resources available for use in the funding and operation of the conducted program

or activity...” See 31 C.F.R. § 17.150(a)(2). The resources available to the BEP in carrying out its currency production program are not limited by normal agency budgetary constraints. The BEP receives no appropriations from Congress. See Exhibit P-21, Ferguson Declaration, ¶ 7. Rather, its operations are financed by means of a revolving fund. This fund is reimbursed through product sales for the direct and indirect costs of operations. Id. The Bureau is authorized to add an amount sufficient to cover any new capital investments and additional working capital requirements in the prices it charges for its products. Id.

In the case of currency production, the Bureau’s costs are reimbursed by the Federal Reserve Board. Id. Accordingly, any increased costs to modify U.S. currency to accommodate the visually disabled would be passed on to the Federal Reserve System. See Exhibit P-21, Ferguson Declaration, ¶ 22. The Federal Reserve System will in turn pass through these costs to its member banks and other private financial institutions. Id.

Therefore, the increased costs involved in modifying U.S. currency to accommodate the visually disabled must be considered in light of the overall size of the U.S. banking system. These increased costs are trivial when compared to the size of the U.S. banking system as a whole. Defendant’s suggestion that such modifications would result in an undue burden is simply untenable.

IV. THE DESIGN OF CURRENCY IMPOSES A SIGNIFICANT BURDEN UPON THE VISUALLY DISABLED

Most Americans are fortunate enough to take for granted the ability to engage in effortless and seamless currency transactions. However, for millions of Americans with blindness or low vision, the use of U.S. banknotes presents a major challenge. This is

due to the fact that U.S. banknotes are identical in size and feel, and virtually identical in color.

Plaintiff Otis Stephens, who is blind and has no pattern vision whatsoever, must rely upon a sighted individual to inform him as to the denomination of a particular banknote. See Complaint, ¶12. See Exhibit P-30, Declaration of Otis Stephens, at ¶¶ 3, 5, 7, 11. Mr. Stephens then uses a system of folding bills in different ways to distinguish between denominations. Id., at ¶ 6.

Plaintiff Patrick Sheehan is able to distinguish between banknotes of varying denominations only in the very best of lighting conditions. See Complaint, ¶13. See Exhibit P-8, Declaration of Patrick Sheehan, at ¶ 4. Mr. Sheehan also uses a system of folding bills in different ways to distinguish between denominations. Id., at ¶ 5.

This system of folding bills provides inadequate assurance that the bills which are handed out represents the correct denomination. Plaintiffs Sheehan and Stephens often hand out larger denominations than they intended. See Exhibit P-8, Declaration of Patrick Sheehan, at ¶ 7. See Exhibit P-30, Declaration of Otis Stephens, at ¶ 7. The visually disabled individual is at a distinct disadvantage if a dispute occurs as to what denomination was actually handed to a vendor. See Exhibit P-12, Declaration of OurMoneyToo.org, at p. 1. Moreover, the system of folding bills provides no assistance in ascertaining whether a vendor provides the correct denominations in return. Id. at p. 1.

There are approximately 3.3 million adults 40 years and older in the United States who have vision impairments, i.e., have corrected visual acuity no better than 20/40 in the better eye. See Exhibit P-37, NIH Statistics on Visual Impairments. About 937,000 of these people are legally blind. Id. See also 42 U.S.C. § 416(i)(1)(B), 20 C.F.R. §

404.1581, which defines legal blindness for social security disability purposes as having corrected visual acuity no better than 20/200 in the better seeing eye. Visual impairments are age related. Approximately 2.7 million of the 3.3 million visually impaired adults in the United States are over the age of 70. See Exhibit P-37, NIH Statistics on Visual Impairments. As the number of older Americans increases, the number of people with visual impairments will also increase. See Exhibit P-9, Declaration of Lorraine Marchi, at ¶ 6.

Full participation in society depends upon the ability to engage in routine currency transactions in an independent and confidential manner. Currency transactions are integral to the routine process of buying and selling merchandise, using vending machines, and participating in daily life activities. Persons with visual disabilities are unable to exchange currency in either an independent or confidential manner. As a result, individuals with visual disabilities suffer needless impediments in such daily life activities as purchasing food and other consumables, transportation, and a variety of other goods and services. See Exhibit P-8, Declaration of Patrick Sheehan, ¶¶ 6-9. See Exhibit P-30, Declaration of Otis Stephens, ¶¶ 11-13.

Further, the possibility of human mistake exists in all currency transactions. The likelihood of such mistakes is increased due to the occurrence of millions of currency transactions on a daily basis. However, the visually disabled individual is unlikely to detect such errors due to their inability to denominate banknotes.

The visually disabled are frequently recognizable as having a substantial life impairment. See Exhibit P-30, Declaration of Otis Stephens, ¶ 8. The visually disabled are completely at the mercy of dishonest merchants when conducting currency

transactions. This factor is itself likely to produce fear and anxiety on the part of the visually disabled when engaging in routine currency transactions.

The visually disabled understandably experience a heightened sense of vulnerability when handling currency. The visually disabled have no independent means to discern whether the denominations they are being handed back is correct. This lack of ability to know whether one is being handed back the correct amount creates a profound sense of insecurity and helplessness on the part of the visually disabled. See Exhibit P-8, Declaration of Patrick Sheehan, at ¶ 9; See Exhibit P-30, Declaration of Otis Stephens, at ¶ 13.

Errors in currency transactions, whether due to fraud or mistake, have a significant financial impact. The majority of the visually disabled are elderly individuals. The elderly as a group comprise a disproportionately high percentage of people living at poverty levels. A \$20 dollar currency error involving an elderly individual could produce a significant financial hardship. See Exhibit P-9, Declaration of Lorraine Marchi, at ¶ 5.

Current banknote design also impairs the ability of the visually disabled to obtain employment in certain areas. There are a vast number of employment positions which demand the ability to engage in spontaneous currency transactions. These positions often exist in the retail sector, such as cashiers at drug and grocery stores. The visually disabled are precluded from obtaining employment opportunities in these areas due to the design of U.S. currency. See Exhibit P-12, Declaration of OurMoneyToo.org., at p. 3.

These burdens are significant for millions of Americans. They are borne on a daily basis by the most vulnerable individuals in our society. The current design of U.S.

currency constitutes a major impediment to disabled individuals in independently engaging in daily life activities.

V. THE RELIEF SOUGHT BY PLAINTIFFS

Plaintiffs are seeking a Declaratory Judgment that Defendant has failed to adhere to its obligations under Section 504 of the Rehabilitation Act in the design of currency. See 29 U.S.C. § 794. Additionally, Plaintiffs are seeking remedial relief in the following two categories: (a) redesign of currency so that individuals who are blind or have low vision will be better able to distinguish between denominations, and (b) furnishing without charge to individuals with low vision and blindness a suitable external device which will assist them in denominating banknotes.

The relief requested does not seek to impose any specific currency design upon Defendant. Rather, Defendant should be ordered to provide for the Court's approval a corrective action plan which will address the needs of the visually disabled. This plan should be provided by the Defendant within 180 days of the Court's order in this action. The corrective action plan should provide for consultation with various disabled user groups in connection with the implementation of any features designed for the visually disabled. Plaintiffs further request that the Court maintain continuing jurisdiction over this matter to ensure Defendant's compliance with its obligations under the statute.

(A) CURRENCY REDESIGN

With respect to the redesign of currency, Plaintiff's recognize that the relief which would be most appropriate for individuals with low vision would have little utility for the blind. Therefore, both population groups should be separately considered in any relief to be ordered by this Court.

There is no doubt that Defendant is currently capable of redesigning currency with additional low vision features. The low vision features which could be useful to individuals with low vision are well known, technically achievable, and not cost prohibitive. These features include, but are not limited to, increasing the size of the large denomination numeral on the bottom right side of the bill, changing the color of the large denomination numeral from green to black to improve contrast, and using different predominant colors for each denomination. The NAS Panel noted that each of these features could be implemented within a period of 1-3 years, and with minimal additional capital investment. See Exhibit P-2, NAS Study, at pp. 68-70.

Plaintiffs are not seeking to require the incorporation of any specific feature into U.S. banknotes. Rather, Defendant should be ordered to furnish for the Court's approval a corrective action plan which will detail the specific low vision features which it intends to incorporate, as well as a timetable for the incorporation of those features.

Defendant would have already been able to incorporate tactile features to assist the blind had it previously followed the recommendations of the NAS Panel in conducting additional research and testing. Nonetheless, these recommendations have not been followed by the Defendant. Therefore, Plaintiffs understand that Defendant will require additional time to design a feature which will be useful to the blind in denominating currency.

Plaintiffs note that there are a variety of features which are already used for this purpose in the currency of other nations. These features range from varying the dimensions of banknotes by denomination, using an embossed tactile feature to indicate denomination, using a tactile foil feature which would indicate denomination by virtue of

its location on the banknote, and using the intaglio printing method to create a tactile raised print feature. There are other features which are currently used for security purposes in currencies, but which could easily be adapted to the needs of the blind. These include use of a tactile micro-perforation feature which could indicate denomination by virtue of its location on the banknote.

Accordingly, Defendant should provide for the Court's approval a corrective action plan which either states the specific features which Defendant intends to implement to assist the blind, or in the alternative, a description of the actions it intends to take, including additional research and testing, which will lead to the incorporation of such features. The plan to be provided for the Court's approval should further contain projected implementation dates, with appropriate milestones to permit ongoing oversight by the Court.

(B) EXTERNAL DEVICES

Defendant has contracted with a private vendor for the development of a prototype electronic note reader. The design of the prototype must facilitate the ability to achieve a target retail price of \$35 or less. See Exhibit P-13, RFQ Specifications, at p. 1. Defendant states that the prototype will be delivered by September 30, 2005. See Exhibit P-6, Def. Response to Interrogatory No. 17.

Unfortunately, Defendant does not have a serious strategy to bring this device to the retail market at an affordable price. The specifications for the development of the prototype provide that the vendor has three years to bring this device to the market. See Exhibit P-13, RFQ Specifications, at p. 3 (Q&A No. 7). This is an inordinately long

period of time. If the vendor fails to achieve this goal, then the design reverts to the public domain, in which case the device may never be brought to the retail market. Id.

Further, Defendant is not able to impose a ceiling on the prices which the vendor may charge the general public for the device. Nor does the government exercise ultimate control over the prices at which this device may be sold to the general public. See Exhibit P-14, Def. Admissions No's 3 & 4. The likelihood of achieving the target retail price of \$35 is minimal if there are relatively few purchasers of the unit. Moreover, Defendant does not intend to participate in the marketing of the unit, or in developing sales channels for the unit. See Exhibit P-13, RFQ Specifications, at pp. 3-4 (Questions and Answers No's. 3, 10, 11). Defendant is also unwilling to provide any subsidy to qualified individuals in purchasing the unit. Id. (Questions & Answers No's 7, 12).

The Secretary's regulations clearly state that the financial burden is upon the Defendant to provide assistive devices to individuals with disabilities. These regulations require the agency to "...furnish appropriate auxiliary aids where necessary to afford an individual with handicaps an equal opportunity to participate in, and enjoy the benefits of, a program or activity conducted by the agency." See 31 C.F.R. §17.160(a)(1). The term "auxiliary aids" is defined as devices which provide the disabled with "equal opportunity to participate in, and enjoy the benefits of, programs or activities conducted by the agency." 31 C.F.R. §17.103(c). The regulations state that auxiliary aids for individuals with visual disabilities include such items as "readers, Brailled materials, audio recordings and other similar services and devices." Id.

The portable hand held electronic reader which is being developed with funds from the Defendant is clearly an auxiliary aid. The sole purpose of this device is to

enable the visually disabled to denominate U.S. banknotes, which they are otherwise unable to do.

Defendant would not incur an undue financial burden in providing such a device to the visually disabled. There are 937,000 legally blind adults 40 years and older in the United States, of whom 648,000 are over the age of 80. See Exhibit P-37, NIH Statistics on Visual Impairments. See also 42 U.S.C. § 416(i)(1)(B); 20 C.F.R. § 404.1581 (defining legal blindness for social security disability purposes). In the highly improbable event that each of these individuals requested a device, the total cost to the U.S. government would be approximately \$33 million (assuming a unit cost of \$35). More likely, only a fraction of the blind would request the device, and the government would likely obtain a price much lower than \$35 by ordering larger quantities. Other governments also provide such devices to visually disabled individuals at no charge. See Exhibit P-20, Bank of Canada, Description of Accessibility Features.

Finally, providing an external device is not a substitute for designing currency in a manner which permits the visually disabled to denominate with their own senses. See Exhibit P-2, NAS Study at p. 63. The Secretary's regulations recognize that services should be provided to the disabled in the most integrated setting appropriate. See 31 C.F.R. § 17.130(d); 31 C.F.R. § 17.150(b). The visually disabled should be permitted to denominate currency without being required to rely on an external device. See Exhibit P-12, Declaration of OurMoneyToo.org at p. 2. Accordingly, the relief sought by this action seeks both currency redesign, as well as furnishing a rapid and reliable external device which may be used by the visually disabled to denominate banknotes.

VI. CONCLUSION

Defendant has not taken any meaningful steps to assist individuals with low vision. The addition of color to the \$20 and \$50 notes provides no assistance to the visually disabled. The larger denomination numeral is smaller than recommended by the NAS Panel, is printed with green and not black ink, is not included on all denominations, and is printed on only one side of the banknote.

Defendant's record is even worse with respect to the blind. Defendant claims to have conducted research into various features which could be useful to the blind. However, in each case, Defendant has either lost the research results, is unable to produce any documents reflecting the results of such research, or has produced results based on testing which excluded the blind from participation. Defendant's future plans to make banknotes accessible to the blind is limited to the commissioning of another study, which is unlikely to provide any relief given that Defendant ignored the recommendations of the NAS Panel in its 1996 and 2004 currency redesigns.

Defendant has no meaningful plans to develop a low cost portable electronic device capable of denominating banknotes. Defendant awarded a contract to develop a prototype unit. However, there is no assurance that the prototype will ever be manufactured for the mass market. Moreover, the contract does not authorize Defendant to impose a ceiling on the prices which may be charged for the unit, nor is Defendant willing to subsidize the cost of the unit for qualified individuals.

Other currencies have incorporated new tactile features which could be useful to the blind. Canadian currency contains a series of durable embossed dots. The Euro contains a foil and an intaglio raised print feature. Swiss currency contains a micro-perf feature which is perceptible to the touch. The NAS Panel found that 23 currencies have

some form of tactile features, and another 120 currencies vary size of banknote by denomination.

The costs of the design changes sought by Plaintiffs are relatively insignificant. The BEP receives no appropriations from Congress. The Bureau's costs are reimbursed by the Federal Reserve Board, which in turn passes its costs to banks and other financial institutions. The increased costs of modifying U.S. currency to accommodate the visually disabled are trivial when compared to the overall size of the U.S. banking system.

Defendant's claim that any new tactile features would reduce the useful life of currency is without merit. Defendant has not produced any test results which would indicate that banknote durability would be compromised by the addition of a tactile feature. Moreover, Defendant's estimate as to the current useful life of currency is grossly inflated when compared to estimates provided by the Federal Reserve Board.

Full participation in society depends upon the ability to engage in routine currency transactions in an independent and confidential manner. There are millions of people who are unable to do so due to the design of currency. Plaintiffs have amply justified their claim for relief, which would substantially alleviate a significant impediment suffered by disabled persons in their daily life activities.

Respectfully submitted,

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**UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA**

AMERICAN COUNCIL OF THE BLIND, et al.,)	
)	
Plaintiffs,)	
)	CIVIL ACTION NO.
v.)	1:02CV00864 JR
)	
JOHN W. SNOW, Secretary of the Treasury,)	
)	
Defendant.)	
)	

**PLAINTIFF’S RULE 7.1 STATEMENT OF
MATERIAL FACTS NOT IN DISPUTE**

Pursuant to LCvR 7.1 (h) of the local rules of United States District Court for the District of Columbia, Plaintiffs submit this statement of undisputed material facts in support of its motion for summary judgment pursuant to Fed. Rule of Civ. P. 56 (a).

1. U.S. banknotes are identical in size and feel, and virtually identical in color.
2. U.S. banknotes provide no basis whatsoever for denominating by blind persons. U.S. banknotes contain minimal cues to assist persons with low vision in distinguishing between denominations.
3. Disabled Americans who suffer from visual disabilities experience difficulty in purchasing goods and services, and conducting ordinary commercial transactions, as a result of the design of currency.
4. Section 504 of the Rehabilitation Act, 29 U.S.C. § 794, requires reasonable accommodations for individuals with disabilities, with respect to the programs and services of the federal government.

5. The burden is upon the agency to prove that compliance with the requirements of Section 504 would result in an undue burden upon the agency. See 31 C.F.R. § 17.150(a)(2).
6. In 1983, the BEP conducted a study entitled "A Study of Mechanisms for the Denomination of Currency by the Blind or Visually Impaired", dated August 24, 1983, (hereinafter referred to as the "1983 Study", and attached hereto as Exhibit P-1).
7. The 1983 Study recommended that BEP seek funding for the development of a sophisticated portable electronic device which could be used by the visually disabled to denominate banknotes. See Exhibit P-1, 1983 Study at pp. 5-6.
8. At the request of Defendant, a separate study was conducted in 1995 by the National Academy of Sciences in connection with the use of currency by the visually impaired (hereinafter referred to as the "NAS Panel" or "NAS Study", and attached hereto as Exhibit P-2). Panel participants included leading experts in the fields of advanced reprographic technology, materials science, substrate materials, banknote production and currency design, psychophysics, optical engineering, chemical engineering, optics and physics, as well as leading experts in low vision and blindness research. See Exhibit P-2, Preface to NAS Study.
9. The NAS Panel recommended that Defendant include the following features in near term (1-3 years) currency redesigns: (a) variation in both height and length of banknotes; (b) use of large, high contrast denomination numerals on a uniform background; (c) use of different predominant colors for each denomination; and

(d) use of denominational UPC coding which could be used by external devices in denominating currency. Additionally, the NAS Panel recommended that the specifications for these new features should strive for sufficient differentiation between denominations to permit rapid, effortless performance. See Exhibit P-2, NAS Study, at pp. 4-5, 75-76. The NAS Panel found that each of the above features could be incorporated based on technologies which are already known and widely used. Id. at pp. 68-70.

10. The NAS Panel noted that banknote size varies with denomination in over 120 countries, and that the technology for accomplishing this change is currently in existence. Id., at p. 40. The Panel also found that this feature is generally considered very useful by the visually impaired. Id. at pp. 40-44. The Panel cited to studies which indicate that variation of at least 5-7mm in both length and height of the banknote results in users achieving a 90% success rate with only 30 minutes of learning. Id. at p. 42.

11. The NAS Panel found that use of a large high contrast numeral would require little or no additional capital investment. See Exhibit P-2, NAS Study, at p. 69. The Panel recommended near term (1-3 years) implementation of this feature. Id. at pp. 4, 68-70. The Panel stated that people with acuity as low as 20/240 could be assisted if the numeral were 60 percent of the current note height. Id. at p. 46. People with acuity at the range of 20/160 would be assisted if the numeral were at least 40 percent of banknote height. Id.

12. The NAS Panel found that use of different predominant colors for each denomination would be relatively inexpensive to implement with little or no

additional capital investment. See Exhibit P-2, NAS Study, at p. 70. The Panel determined that enough research currently exists to allow experts to identify the primary colors which would be most useful to the visually impaired in facilitating denomination. Id. at p. 47. The Panel recommended near term (1-3) years implementation of this feature. Id. at pp. 68-70.

13. The NAS Panel also recommended that Defendant pursue a broad research agenda, with a view towards identifying potential combinations of features which could be employed to enhance denomination. Specifically, the NAS Panel recommended that “high priority” research be conducted to determine “optimum dimensions, optical contrast, location, colors, physical size” for making recognition and denomination of U.S. banknotes easy and convenient for visually disabled individuals. See Exhibit P-2, NAS Study, at pp. 65, 76.

14. The NAS Panel recommended “near or mid-term research” to determine the gradations which will permit reliable human discrimination of low-relief tactile features. Id., at p. 65. See also pp. 5, 76. The NAS Panel urged the Defendant to conduct research into the development of durable tactile features. See Exhibit P-2, NAS Study, at pp. 5, 59, 62, 63, 86. The NAS Panel also recommended that Defendant work with device developers to develop improved external devices which could be useful to the visually impaired. Id. at pp. 76. The Panel recommended that Defendant involve appropriate user groups as early as possible to ensure selection of those features which would be most useful to the disabled population. Id. at pp. 6, 77.

15. The manner in which Defendant has added color to banknotes is completely inconsistent with the recommendations of the NAS Panel. The NAS Panel recommended the use of a different predominant color for each banknote. See Exhibit P-2, NAS Study at p. 47. The NAS Panel stated that a mix of colors is not desirable from a denomination standpoint. Id. The Committee also warned that blues and greens should not be used together, as it is particularly difficult to discriminate between these colors. Id.
16. The color scheme adopted by the Defendant relies upon a mix of subtle colors, instead of a single predominant color for each denomination. Background colors of blue and red have been added to the \$50 note. See Exhibit P-3, Reproduction of \$50 and \$20 notes. The \$20 note features background colors of blue, peach, and green. Id. However, the main colors of \$50 and \$20 denominations remain green and black; the other colors are present only in subtle shades in secondary design elements. The BEP website properly describes the background colors on the \$20 and \$50 notes as “subtle.” See Exhibits P-4 and P-5, BEP Description of Color on \$20 and \$50 Notes. The present use of color does not provide adequate contrast between denominations. See Exhibit P-8, Declaration of Patrick Sheehan, at ¶ 10.
17. Defendant’s introduction of the larger denomination numeral on the reverse of the \$5 and higher banknotes is inconsistent with the recommendations of the NAS Panel. The NAS Panel recommended that the large denomination numeral be at least 40% - 60% of the current banknote height of 66.3 mm, preferably on each side of the banknote. See Exhibit P-2, NAS Study, at p. 46. See also Exhibit P-6,

- Def. Response to Interrogatory No. 15. Therefore, at a minimum, the large denomination numeral should be 26.52 mm. The NAS Panel also recommended that the large denomination numeral be printed in black ink against a white background, or in white against a black background. See Exhibit P-2, NAS Study at p. 46.
18. The larger denomination numeral on the \$5, \$10, \$20, and \$50 banknotes is 13 mm, or slightly less than 20% of the current banknote height. See Exhibit P-7, Def. Response to Interrogatory No. 12. This is less than half of the size recommended by the NAS Panel. The larger denomination numeral is placed on only one side of the banknote, contrary to the recommendations of the NAS Panel. See Exhibit P-2, NAS Study at p. 46. See also Exhibit P-9, Declaration of Lorraine Marchi, at ¶7. The larger denomination numeral has not been included on the \$1, \$2, and \$100 banknotes.
19. The larger denomination numeral introduced by Defendant is printed in green, as opposed to black ink, thereby reducing contrast levels.
20. Defendant's sole reason for using green ink is that it is the color traditionally associated with U.S. banknotes. See Exhibit P-10, BEP Explanation for Use of Green Ink.
21. The BEP's 1983 Study evaluated various features which could be used by the visually disabled to denominate currency. The 1983 Study concluded that the most practical solution was to pursue the development of a portable electronic device capable of denominating banknotes. See Exhibit P-1, 1983 Study, at p. 6.

22. The NAS Panel noted that portable electronic devices capable of denominating currency tend to be unreliable, slow, and expensive. See Exhibit P-2, NAS Study at p. 25.
23. Ms. Julia Wilson, a Supervisory Paralegal at the U.S. Department of Justice tested the Brytech Note Teller 2 electronic currency reader. See Exhibit P-11, Declaration of Ms. Julia Wilson. The test results at Table A relates to the newer series of bills (Series 2002 through 2004), and the test results at Table B relate to older series (Series 1981 through 2001). The test results at Table A reveal a 25% error rate, while the test results at Table B reveal a 6% error rate. Id. at ¶5. Ms. Wilson's Declaration further notes that the retail price of this item is \$270 per unit. See Exhibit P-11, Declaration of Julia Wilson, at ¶ 8.
24. In August 2004, the BEP issued Request for Quotations ("RFQ") 04-0687 seeking the development of a pocket sized device with a target retail price of \$35 or less, which could be used to determine the denomination of US currency. See Exhibit P-13, RFQ Specifications. Under the terms of the RFQ, the selected vendor would be provided with up to \$50,000 to develop a prototype of a device which would have an inconclusive read rate of no greater than ten per thousand notes read, and an incorrect read rate of no greater than one per fifty thousand notes read. The successful vendor would have three years after delivery of a working prototype to bring the device to the retail market. If the vendor failed to bring the device to the retail market within the three year time frame, the design would be made public, and other companies would be invited to bring the device to the retail market. Id., at pp. 1, 3. An award incorporating the terms of the RFQ was

- made to Mnemonics Technologies, Inc., on September 30, 2004. See Exhibit P-7, Def. Response to Interrogatory No. 13.
25. The specifications do not specify the response times which the prototype must be capable of achieving. See Exhibit P-13, RFQ Specifications. The specifications require that the prototype be capable of reading banknotes in only two out of four orientations. Id.
26. If a successful prototype is developed, the vendor has three years to bring the design to the retail market. Id. If the vendor fails to achieve this goal, then the design reverts to the public domain, in which case the design may still not be brought to the retail market. Id.
27. The RFQ states that the design “should facilitate the ability to mass-produce the units with a retail target price of less than thirty-five U.S. dollars.” Id.
28. The retail price of such a unit depends largely on the size of the market and the number of people willing to purchase the item.
29. Defendant states that “the agreement does not establish a ceiling on the sale price of the device to the public” and further that the government “...does not exercise control over the ultimate sale price.” See Exhibit P-14, Def. Admissions No’s 3 & 4.
30. The Treasury will not assume any role in marketing the unit, or in developing sales channels for the unit. See Exhibit P-13, RFQ Specifications. at pp. 2-3 (Questions and Answers No’s. 3, 10, 11).
31. Defendant will not provide any subsidy to qualified individuals in purchasing the unit. See Exhibit P-13, RFQ Specifications, at pp. 3-4 (Questions & Answers

- No's 7, 12). Defendant is unwilling to underwrite any portion of the cost of the unit for individuals who may be unable to afford it. Id.
32. The Secretary's regulations state that the financial burden is upon the Defendant to provide assistive devices to individuals with disabilities. See 31 C.F.R. §17.160(a)(1). The portable hand held electronic reader which is being developed with funds from the Defendant is an auxiliary aid. 31 C.F.R. §17.103(c).
33. There are 937,000 legally blind adults 40 years and older in the United States, of whom 648,000 are over the age of 80. See Exhibit P-37, NIH Statistics on Visual Impairments. In the highly improbable event that each of these individuals requested a device, the total cost to the U.S. government would be approximately \$33 million (assuming a unit cost of \$35). More likely, only a fraction of the blind would request the device.
34. The likelihood of achieving the target retail price of \$35 or less for the note teller being developed with federal funds would be significantly enhanced if the government purchased a significant quantity, thereby resulting in economies of scale. Other governments provide such devices to their visually disabled citizens at no charge. See Exhibit P-20, Bank of Canada, Description of Accessibility Features.
35. Defendant claims to have conducted research and testing with respect to the following features: (a) inclusion of a large denomination numeral on the reverse side of the banknote; (b) inclusion of an embossed feature currently used on Canadian banknotes; (c) inclusion of a micro-perforation design currently used in

Swiss currency, and (d) determination as to optimal color patterns for the visually disabled. See Exhibit P-6, Def. Response to Interrogatories No's. 14-16.

36. Defendant states that it obtained an assessment by the University of Minnesota Laboratory for Low-Vision Research in connection with its design of the larger denomination numeral placed on the reverse side of the \$5 and higher banknotes. See Exhibit P-6, Def Response to Interrogatory No. 15. However, Defendant is unable to locate a copy of this assessment. See Exhibit P-14, Def. Response to Document Production Request No. 19. Defendant is not certain whether the results of this assessment were conveyed orally or in writing. See Exhibit P-15, Letter from Defendant's Counsel dated August 1, 2005.
37. Defendant states that it tested an embossed feature which is currently used on Canadian banknotes. See Exhibit P-6, Def. Response to Interrogatory No. 14. Canadian currency incorporates a series of embossed dots which are used by the visually disabled to distinguish between denominations. This embossed feature was applied to ten (10) U.S. banknotes. See Exhibit P-36, Declaration of H.H. Holton, at ¶ 8. Defendant stated that the Canadian feature "was found to have insufficient durability to approximate the average length of time required for Federal Reserve notes to remain in circulation." See Exhibit P-6, Def. Response to Interrogatory No. 14.
38. Defendant was asked to produce the results of any testing which it conducted to determine the durability of the Canadian feature. See Exhibit P-14, Def. Response to Document Production Request No. 17. In response, Defendant furnished the document entitled "Tactile Feature for the Blind." Id. However, this

document reflects only durability testing of the Canadian feature on Canadian banknotes. See Exhibit P-16, Tactile Feature for the Blind, at pp. 6-7.

Defendant has not produced any test results reflecting upon the durability of the Canadian feature on U.S. banknotes.

39. The Canadian Bank Note Company developed and patented the Canadian tactile feature, and is one of two companies under contract to print paper currency for the Bank of Canada. See Exhibit P-36, Declaration of H.H. Holton, at ¶ 3,4.

40. At the request of Defendant, the Canadian Bank Note Company conducted preliminary wear testing on ten (10) U.S. banknotes using the Canadian formula. After wear testing, the relief provided by the Canadian feature on U.S. banknotes was reduced on average from 110 microns to 20 to 35 microns. Id. at ¶ 8. Based on research conducted by the Canadian Bank Note Company, the 20 to 30 micron range on worn banknotes was found to be “satisfactory” with a 55 micron height or greater being “very good” as rated by the visually impaired. Id.

41. The Canadian Bank Note Company states that it is probable that the embossed feature could be applied to U.S. banknotes in a manner which would be useful to the blind. Id. at ¶ 9.

42. Defendant’s claim to have conducted durability testing on the Canadian feature contradicts Defendant’s sworn statement in which it admits that it is unable to determine the extent to which an embossed feature would reduce the useful life of U.S. banknotes, or even whether such reduction would be significant. See Exhibit P-7, Def. Answer to Interrogatory No. 5.

43. Defendant could not have reached any meaningful conclusions as to the durability of the Canadian feature on the basis of a test sample of ten (10) U.S. banknotes. Sample sizes of 1000 banknotes notes are normally required to produce statistically valid conclusions. See Exhibit P-36, Declaration of H.H. Holton, at ¶ 10.
44. Defendant also states that it tested a micro-perforation design developed for use as a security feature in Swiss currency to determine whether it could be useful to the visually disabled. See Exhibit P-33, Copy of Swiss Bank Note. Defendant stated that the presence of the perforation design was detectable by visually impaired persons. However, “the specific patterns could not be identified sufficiently for accurate denomination of currency. An analysis to determine the effectiveness and durability of the feature indicated that the perforation pattern could be altered or simulated easily and that the holes left by perforating accumulated dirt and debris.” See Exhibit P-6, Def. Response to Interrogatory No. 14.
45. Defendant was asked to produce the results of any testing which it conducted to determine the effectiveness and the durability of the micro-perforation feature. See Exhibit P-14, Def. Response to Document Production Request No. 18. In response, Defendant furnished a single page memorandum from Robert Stone to Thomas A. Ferguson, dated September 4, 2002. Id. However, this memorandum merely requests approval to provide twenty blank pieces of U.S. banknote paper to Switzerland for testing. See Exhibit P-17, Memorandum from Robert Stone to Thomas A. Ferguson, dated September 4, 2002. Defendant has not produced any

test results reflecting upon the durability or the effectiveness of the Swiss micro-perforation feature on U.S. banknotes.

46. Defendant admitted that the presence of the micro-perforation design was detectable by persons with visual disabilities. See Exhibit P-6, Def. Response to Interrogatory No. 14. See also Exhibit P-18, Report Prepared by Deloitte & Touche/Shugoll, at p. 22. The micro-perforation method could provide a meaningful denomination cue merely by virtue of its location on the banknote, even if the specific micro-perforation pattern is not itself sufficient to provide denomination information.
47. Defendant was also asked to describe any testing which it conducted to determine the optimal color schemes which would be useful to the visually disabled. Defendant stated that it contracted with Deloitte & Touche/Shugoll to conduct a research study as to how color may be useful to the visually disabled in denominating currency. See Exhibit P-6, Def. Response to Interrogatory No. 16.
48. The purpose of the Deloitte study was to determine public awareness of design and counterfeit features in the new currency, and to determine the receptivity of the target audiences to various anti-counterfeiting features. See Exhibit P-18, Report Prepared by Deloitte & Touche/Shugoll, June 2002, Executive Summary at p.2. The target audiences were derived from individuals in the following groups: consumers, bank tellers, cashiers, gaming industry employees, law enforcement officials, and teachers. Id. The study protocols expressly excluded from participation individuals with visual impairments. Id. at Appendix A, pp. 4R, 6C.

49. Defendant's future plans to make banknotes accessible to persons with visual disabilities are limited to the commissioning of another study, the addition of colors to all denominations, and continuing to include a larger denomination numeral on the reverse side of the banknote. See Exhibit P-6, Def. Response to Interrogatory #20.
50. The conclusions of the 1983 and 1995 studies were well known to Defendant when it conducted its 1996 and 2004 currency redesigns.
51. Defendant's statement that it will add color to all denominations is contradicted by the most recent report from its Chief Financial Officer. According to the latter, Defendant has no plans to redesign the \$5 note, and the \$1 and \$2 notes will not be redesigned. See Exhibit P-34, 2004 CFO Report, at p. 7.
52. The NAS Panel found that different sized currency is an established practice in over 120 countries. See Exhibit P-2, NAS Study at p. 40. The Panel found that 24 countries have adopted a specific scheme involving the use of large denomination numerals. Id. at p. 102. The Committee found that 167 out of 171 issuing authorities use a clearly differentiated color scheme for all denominations. Id., at p. 102. At the time of the 1995 NAS Study, there were 16 countries that used intaglio printing to produce tactile marks on each denomination. Id., NAS Study at p. 103. Another 7 currencies place tactile features on certain denominations. Id.
53. The Euro was introduced on January 1, 2002. During the development of the Euro, designers and printing experts consulted the European Blind Union.

54. On the front of each Euro note is a large denomination numeral over 2 centimeters tall, which is set against a pale background. This large denomination numeral is manufactured with intaglio printing, and is designed to be perceptible to touch. See Exhibit P-19, Euro Vision, Understanding Euro Notes and Coins, A Guide for People with Poor Vision, jointly published by the European Blind Union, European Commission, and the European Central Bank, at p. 4. Specific patterns using intaglio print which are perceptible to touch are also printed along the edges of the EUR 200 and EUR 500 banknotes to help with recognition. These edge patterns are printed using the intaglio method. Id. at p. 5. Additionally, the notes have a foil feature which is also perceptible to touch. The foil feature on the 5, 10, and 20 Euro notes differs in shape and position from the foil feature on the 50, 100, 200, and 500 notes. Id. at p. 6.
55. The length of the Euro increases by 6-7 mm with each denomination. The smallest note, which is the 5 Euro, is 12 cm long, while the largest note is 16 cm long. The 5, 10, 20, 50, and 100 notes also increase in height. The 5 Euro note is 6.2 cm in height, while the 100 Euro note is 8.2 cm in height. Id. at p. 5.
56. Each Euro denomination has a striking dominant color, used on the front and the reverse sides. The dominant colors for each Euro denomination are: 5 Euro – Grey; 10 Euro – Red; 20 Euro – Blue; 50 Euro – Orange; 100 Euro – Olive Green; 200 Euro – Yellow-Brown; 500 Euro – Purple. Id. at p. 6.
57. The Canadian currency was redesigned in 2001 after extensive consultation with blind and visually impaired Canadians. The newly redesigned currency incorporates a series of symbols formed by groupings of six raised dots separated

by a smooth surface. Each symbol is composed of two columns of three raised dots. These dots are embossed and back-coated to enhance their durability. See Exhibit P-20, Bank of Canada, Description of Accessibility Features.

58. The number and position of these symbols vary according to the denomination.

The \$5 note has one symbol, the \$10 note has two symbols separated by a smooth surface, the \$20 note has three symbols separated by two smooth surfaces, and the \$50 note has four symbols separated by three smooth surfaces. Like the \$10 note, the \$100 bank note has two symbols, but the smooth surface between them is wider. Id.

59. The Canadian feature was subject to extensive durability testing prior to its incorporation. See Exhibit P-16, Tactile Feature for the Blind, at pp. 6-7. The results demonstrate that the embossed feature would not reduce the durability of Canadian banknotes. Id. The embossed symbols provide a relief of 140 microns, which relaxes back to 125 microns after issuance. Id., at p. 5. After a few minutes of training, users are able to denominate using the embossed symbol within an average of 13 seconds. Id. The redesigned notes did not present any stacking concerns to the Bank of Canada. Id. at p. 7.

60. The issue of cost of making accommodations for the disabled was addressed by the BEP in its 1983 study. The cost impacts of making currency accessible to the visually disabled were summarized in Figure 2 of the BEP study. See Exhibit P-1, 1983 Study.

61. The issue of cost was also addressed by the NAS Panel. The NAS Panel concluded that at least three of the features which could be useful to the visually

disabled, i.e., color, large denomination numeral, and holes, could be achieved with little additional capital expenditures. Exhibit P-2, NAS Study, at pp. 69-70. The NAS Panel also found that use of different predominant colors for each denomination, and inclusion of a large denomination numeral, could be implemented within a 1-3 year period. Id., at pp. 68-70.

62. Cost impacts were addressed by Defendant in responding to Plaintiff's Interrogatories during the course of this litigation. Defendant was asked to estimate the total costs involved in adding specific accessibility features to U.S. currency, including research, design, and manufacturing expenses. The following estimates provided by Defendant reflect the cost of modifying all denominations, including the \$1 note.
63. Defendant states that adding a large denomination numeral, which is at least 60% of current banknote height, would require a one time outlay of \$4,500,000, plus additional annual costs in the amount of \$400,000. See Exhibit P-7, Def. Response to Interrogatory No. 8. The use of large geometric shapes on banknotes would require a one time outlay of \$4,500,000, with no additional annual costs. See Exhibit P-7, Def. Responses to Interrogatory No. 10. The use of different predominant colors on each banknote would require a one time outlay of \$48,000,000, with additional annual cost in the amount of \$20,000,000. See Exhibit P-7, Def. Response to Interrogatory No. 9. None of these features would have any impact on banknote durability. See Exhibit P-6, Def. Admissions No's 1 and 2.

64. Defendant estimates that the cost impact of varying the length and height of currency would be \$245 - \$320 million in initial costs. See Exhibit P-21, Declaration of Thomas Ferguson, Director of the Bureau of Engraving and Printing, dated August 28, 2002 (hereinafter the “Ferguson Declaration”), ¶ 52. However, \$70-\$90 million of the initial start up costs is related to public education expenses, as opposed to any cost involved in the production of currency. Id.
65. The Ferguson Declaration further refers to increased annual expenses in the amount of \$143 - \$174 million related to varying the height and length of banknotes. Id. However, \$92 - \$109 million of the estimated increased annual costs are related to replacing prematurely worn currency. Id. The additional cost of replacing prematurely worn currency would only be incurred if an embossed numeral or tactile feature is included, in addition to the dimensional changes. See Ferguson Declaration, ¶¶ 49-51. Therefore, the additional annual costs of varying the height and length of banknotes, without also including an embossed numeral or other tactile feature, would be \$51 - \$65 million.
66. Defendant states that the cost to emboss a numeral on banknotes would require a one-time outlay of approximately \$45.5 million, plus additional annual costs of \$16,000,000. See Exhibit P-7, Def. Response to Interrogatory No. 5. Defendant states that the total costs to include a micro-perforation feature perceptible to touch would require a one time outlay of \$75 million, plus additional annual costs of \$9 million. See Exhibit P-7, Def. Response to Interrogatory No. 6. Defendant states that the cost of adding a foil feature to banknotes which is perceptible to

- touch would result in a one-time outlay of \$51.5 million, plus additional annual costs of \$15.3 million, excluding the cost of the foil, which the Defendant declines to estimate. See Exhibit P-6, Def. Response to Interrogatory No. 22.
67. U.S. currency is currently producing using the intaglio method. See Exhibit P-22, BEP Description of Intaglio Process. Defendant declines to estimate the costs of using intaglio printing to create a tactile feature on banknotes because it considers it unlikely that such a feature could be produced. See Exhibit P-6, Def. Response to Interrogatory No. 21.
68. The Euro uses the intaglio method to create a large denomination numeral which is perceptible to the touch. See Exhibit P-19, Euro Vision, Understanding Euro Notes and Coins, at p. 4. Specific patterns using intaglio print which are perceptible to touch are also printed along the edges of the EUR 200 and EUR 500 banknotes to help with recognition. Id. at p. 5. The Japanese yen also uses intaglio print to incorporate a tactile feature specifically designed to assist the blind in denominating currency. See Exhibit P-32, Bank of Japan Description of Yen Note. At the time of the 1995 NAS Study, there were 16 countries that used intaglio printing to produce tactile marks on currency. See Exhibit P-2, NAS Study at p. 103.
69. Defendant's cost estimates are based on the cost of modifying all denominations, including the \$1.00 note. The \$1 note consists of approximately 50% of all currency production. See Exhibit P-21, Ferguson Declaration at ¶5. Defendant asserts that it is precluded from modifying the \$1 note due to legislative restrictions. See Def. Motion for Summary Judgment, at 18. Therefore, the cost

estimates provided by Defendant are likely to be significantly reduced if the cost of modifying the \$1 note is subtracted.

70. Defendant asserts that the initial costs to design and engrave an enlarged denomination numeral would be \$4,500,000. Documents provided by Defendant to support this estimate indicate that the initial cost to design and engrave the larger denomination numeral equals only \$354,544. The latter figure is based upon an estimate of a total of 2,650 engraving hours, at an hourly rate of \$133.79. See Exhibit P-23, Cost Impact of Enlarged Numeral, Def. Response to Third Document Production Request.

71. Defendant increases its one-time cost estimate from \$354,544 to \$4.5 million solely on the basis of a two sentence email to the BEP legal counsel, which neither explains the increase nor even references a figure of \$4.5 million. See Exhibit P-24, Def. Response to Document Production Request No's 10-16, Answer No. 12, and Exhibit P-25, email from Len Olijar, dated April 19, 2005. Defendant would be required to expend 33,634 additional engraving hours to design the larger denomination numeral in order to reach an initial outlay cost of \$4.5 million, assuming an hourly rate of \$133.79.

72. Defendant asserts that to emboss currency it will be required to purchase 12 embossing machines at \$3 million each (See Exhibit P-26, Cost Impact of Embossing Feature, Def. Response to Third Document Production Request); to perforate currency it will be required to purchase 12 perforation machines at \$5.5 million each (Exhibit P-27, Cost Impact of Perforation Feature, Def. Response to Third Document Production Request); and to add foil it will be required to

purchase 12 foil stamp machines at \$3.5 million each (Exhibit P-28, Cost Impact of Foil Stamp, Def. Response to Third Document Production Request).

Defendant provides no documentation as to how it arrived at its estimated cost per machine, notwithstanding Plaintiff's request for all documents supporting Defendant's cost estimates. See Exhibit P-24, Def. Response to Document Production Requests No's 10-16.

73. Defendant states that each new embossing machine will require hiring 2 pressman and 1 KG-4 helper per machine shift (Exhibit P-26, Cost Impact of Embossing Feature); each new perforating machine will require hiring one additional plate printer per machine shift (Exhibit P-27, Cost Impact of Perforation Feature), and each new foil stamp machine will require hiring 2 pressman and 1 KG-4 helper per machine shift (Exhibit P-28, Cost Impact of Foil Stamp). Defendant provides no supporting documentation as to how it arrived at its estimated staffing cost per machine.

74. Defendant asserts that the addition of different colors for each denomination would require a one time additional equipment cost of \$48 million, plus increased annual costs of \$20 million, primarily for labor. See Exhibit P-7, Def. Response to Interrogatory #9. Documents supporting this estimate reflect that the additional capital costs consist of the purchase of 4 new printing presses at \$12 million each. See Exhibit P-29, Cost Impact of Offset Printing Feature, Def. Response to Third Document Production Request. The increased labor cost consists primarily of the additional labor required to operate each new machine. Id.

75. Defendant's cost estimates are inconsistent with the findings of the 1995 NAS Panel, which found that little additional capital investment would be required to add color to banknotes. See Exhibit P-2, NAS Study, at p. 70. In any event, Defendant has already added different colors to the \$20 and \$50 notes. See Exhibit P-7, Def. Response to Interrogatory #9. Accordingly, the increased costs reflected above can only consist of the amounts required to add color to the remaining five denominations.
76. Defendant states that it currently plans to add different background colors to all seven denominations. See Exhibit P-6, Def. Response to Interrogatory #20. Defendant will incur the additional costs of adding different background colors for each denomination regardless of the outcome of this litigation.
77. Defendant states that it has spent \$4.2 billion over the past 10 years to produce currency. See Exhibit P-7, Def. Response to Interrogatory No. 1. This equates to an average of approximately \$420,000,000 per year. Defendant further states that every aspect of currency production involves the incorporation of anti-counterfeiting features. See Exhibit P-7, Def. Response to Interrogatory No. 2. Therefore, Defendant states that it has spent \$4.2 billion for this purpose as well. Id.
78. The use of different predominant colors for each denomination would result in increased annual costs \$20 million (Exhibit P-7, Def. Response to Interrogatory No. 9), which is less than 4.7% of the average annual \$420 million production cost.

79. The inclusion of an embossed numeral would result in increased annual costs of \$16 million (Exhibit P-7, Def. Response to Interrogatory No. 5), or approximately 3.8% of average annual production costs.
80. Addition of a foil feature would result in increased annual costs of \$15.3 million (Exhibit P-6, Def. Response to Interrogatory No. 22), excluding the cost of the foil itself which Defendant declines to estimate. This annual increase is approximately 3.6% of the average yearly \$420 million production cost.
81. The use of a micro-perforation feature would result in additional annual costs of \$9 million (Exhibit P-7, Def. Response to Interrogatory No. 6), or approximately 2% of average annual production costs.
82. The inclusion of a large denomination numeral would result in increased annual costs of \$400,000 (Exhibit P-7, Def. Response to Interrogatory No. 8), which is approximately .095 percent, or less than one-tenth of one percent, of the average annual production costs.
83. The use of large geometric shapes on banknotes to indicate denomination would result in no increased annual costs. See Exhibit P-7, Def. Responses to Interrogatory No. 10.
84. Defendant calculated the cost increases associated with making the design modifications sought by Plaintiffs on the basis of its costs per 1000 notes. See Exhibit P-23, Cost Impact of Enlarged Numeral; Exhibit P-26, Cost Impact of Embossing Feature; Exhibit P-27, Cost Impact of Perforation Feature, Exhibit P-28, Cost Impact of Foil Stamp; Exhibit P-29, Cost Impact of Offset Printing Feature. Approximately 50% of the Bureau's production volume consists of the

\$1 note. See Exhibit P-21, Ferguson Declaration at ¶5. Therefore, the annual cost increases provided by Defendant in connection with making these design modifications must also be decreased by 50%, assuming that no modifications are made to the \$1 note. The initial equipment costs estimated by Defendant must also be proportionately reduced by one-half, as only 50% of the estimated equipment would be required to meet the correspondingly reduced production volumes.

85. Defendant states that it has already spent approximately \$49 million to make currency accessible to persons with visual disabilities. See Exhibit P-7, Def. Response to Interrogatory No. 4. Defendant states that these costs were incurred for the purpose of adding color and a large denomination numeral. Id.

86. Defendant states that its current cost estimates do not include any reduction in the useful life of the currency due to degradation of the embossed numeral or the micro-perforation feature. Defendant states that the reduction in the useful life of banknotes associated with degradation of these features “cannot be determined.” See Exhibit P-7, Def. Response to Interrogatories No’s. 5, 6. The Ferguson Declaration states that no testing has been conducted to determine the extent to which the useful life of a note would be reduced by inclusion of such features. See Exhibit P-21, Ferguson Declaration, ¶ 50.

87. Defendant’s estimates as to the useful life of currency are inconsistent with estimates provided by the Federal Reserve Board. The Director of the BEP stated that a “on average, a five dollar bill is withdrawn after approximately two years in circulation, a ten dollar bill is withdrawn after approximately 3 years in

circulation, a twenty dollar bill is withdrawn after approximately four years in circulation, and both a fifty and a one hundred dollar bill is withdrawn after approximately nine years in circulation.” See Exhibit P-21, Ferguson Declaration at ¶ 50.

88. The Federal Reserve Board states that the average life of a \$5 note is 16 months, a \$10 note is 18 months, a \$20 note is 24 months, a \$50 note is 55 months, and a \$100 note is 89 months. See Exhibit P-35, Federal Reserve Board FAQ.

89. The BEP receives no appropriations from Congress. See Exhibit P-21, Ferguson Declaration, ¶ 7. Rather, its operations are financed by means of a revolving fund. This fund is reimbursed through product sales for the direct and indirect costs of operations. Id. The Bureau is authorized to add an amount sufficient to cover any new capital investments and additional working capital requirements in the prices it charges for its products. Id.

90. In the case of currency production, the Bureau’s costs are reimbursed by the Federal Reserve Board. Id. Any increased costs to modify U.S. currency to accommodate the visually disabled would be passed on to the Federal Reserve System. See Exhibit P-21, Ferguson Declaration, ¶ 22. The Federal Reserve System will in turn pass through these costs to its member banks and other private financial institutions. Id.

91. Plaintiff Otis Stephens, who is blind and has no pattern vision whatsoever, must rely upon a sighted individual to inform him as to the denomination of a particular banknote. See Complaint, ¶12. See Exhibit P-30, Declaration of Otis Stephens,

at ¶¶ 3, 5, 7, 11. Mr. Stephens then uses a system of folding bills in different ways to distinguish between denominations. Id., at ¶ 6.

92. Plaintiff Patrick Sheehan is able to distinguish between banknotes of varying denominations only in the very best of lighting conditions. See Complaint, ¶13. See Exhibit P-8, Declaration of Patrick Sheehan, at ¶ 4. Mr. Sheehan also uses a system of folding bills in different ways to distinguish between denominations. Id., at ¶ 5.

93. Plaintiffs Sheehan and Stephens often hand out larger denominations than they intended. See Exhibit P-8, Declaration of Patrick Sheehan, at ¶ 7. See Exhibit P-30, Declaration of Otis Stephens, at ¶ 7.

94. The visually disabled individual is at a distinct disadvantage if a dispute occurs as to what denomination was actually handed to a vendor. See Exhibit P-12, Declaration of OurMoneyToo.org, at p. 1.

95. The system of folding bills provides no assistance in ascertaining whether a vendor provides the correct denominations in return. Id. at p. 1.

96. There are approximately 3.3 million adults 40 years and older in the United States who are visually impaired, i.e., have corrected visual acuity no better than 20/40 in the better eye. About 937,000 of these people are legally blind for social security disability purposes. Exhibit P-37, NIH Statistics on Visual Impairments. Visual impairments are age related. Approximately 2.7 million of the 3.3 million visually impaired people adults in the United States are over the age of 70. Id. As the number of older Americans increases, the number of people with low vision

and other visual impairments will also increase. Exhibit P-9, Declaration of Dr. Lorraine Marchi, at ¶ 6.

97. Full participation in society depends upon the ability to engage in routine currency transactions in an independent and confidential manner. Currency transactions are integral to the routine process of buying and selling merchandise, using vending machines, and participating in daily life activities.
98. The possibility of human mistake exists in all currency transactions. However, the visually disabled individual is less likely to detect such errors due to their inability to denominate banknotes.
99. The visually disabled are frequently recognizable as having substantial life impairment. See Exhibit P-30, Declaration of Otis Stephens, ¶ 8. The visually disabled are completely at the mercy of dishonest merchants when conducting currency transactions, as they have no independent means to discern whether the change they are being handed back is correct. This factor itself produces fear and anxiety on the part of the visually disabled when engaging in routine currency transactions. See Exhibit P-8, Declaration of Patrick Sheehan, at ¶ 9; See Exhibit P-30, Declaration of Otis Stephens, at ¶ 13.
100. Errors in currency transactions, whether due to fraud or mistake, may have a significant financial impact. The majority of the visually disabled are elderly individuals. The elderly as a group comprise a disproportionately high percentage of people living at poverty levels. A \$20 dollar currency error involving an elderly individual could produce a significant financial hardship. See Exhibit P-9, Declaration of Lorraine Marchi, at ¶ 5.

101. There are a vast number of employment positions which demand the ability to engage in spontaneous currency transactions. These positions often exist in the retail sector, such as cashiers at drug and grocery stores. The visually disabled are precluded from obtaining employment opportunities in these areas due to the design of U.S. currency. See Exhibit P-12, Declaration of OurMoneyToo.org., at p. 3.

Respectfully submitted,

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