COST BENEFIT ANALYSIS OF THE DELWARE ALTERNATIVE FINANCING LOAN PROGRAM OF ASSISTIVE TECHNOLOGIES FOR THE DISABLED

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EXECUTIVE SUMMARY

1. The purpose of the proposed Alternative Financing Program (AFP), is to establish a Delaware statue government financed "loan" fund that would guarantee bank loans (loan guarantees) and/or subsidized them (interest buy downs) of disabled individuals for their purchases of various Assistive Technologies (AT).

2. The evaluation of the proposed program presented in this report is a cost benefit analysis of the feasibility of the AFP, whereby the (opportunity) costs of the program is compared to the positive outcomes of the AFP in the form of benefits, which are the monetary value of the outcomes.

3. The opportunity costs consist primarily of three alternative capitalization levels of the loan fund: $1,000,000, $2, 000,000, and $5,000,000, which entail a federal –state match of respectively of $3:$1.

4. Based on a 100% loan guarantee, the $1,000,000 capitalization would support banks loans, for 8 years, the $2,000,000 for 13 years, and the $5,000,000 for 20 years.

5. There are numerous potential benefits of the AFP but, many are not readily amenable to quantification and the assignment of monetary value as required by CBA, and for many hypothesized benefits, there is a lack of empirical evidence that links the relationship of AT with positive outcomes for disabled individuals, caregivers, and citizens of the State.

6. Two positive outcomes were employed in the analysis and transformed into benefits.

7. Financial costs savings of medical costs from the prevention of falls among disabled and caregivers were calculated as a small value in benefit, but this determination was based on a very conservative assumptions.

8. A second and major benefit, over 95% of all benefits, was the value of earning by disabled who would go to work if they obtained loans for AT purchases.

9. Two estimates of earnings were undertaken, 55% and 28% of potential loans to disabled would generate full-time or part-time employment as a result of the purchased AT.

10. Under both theses estimates, the CBA revealed that the Net Present Value (benefits less costs) were highly positive and all the Benefit:Cost ratios were very positive.

11. These results held for all three capitalization levels, and for a range of discount rates from 1% to 6%.

I. PURPOSE OF REPORT

This report presents an economic evaluation of a jointly financed State and Federal low-interest loan program—the Alternative Financing Program, (AFP)--for aiding disabled citizens. In general, the objective of the program is to provide disabled individuals who have physical limitations with access to Assistive Technologies (AT) so that they can function effectively within and outside the home. The program would guarantee or subsidize commercial bank loans to disabled individuals for their purchases of home environmental interventions, (EI), vehicular mobility (VM), mobility equipment (ME), and assistive technology devices (ATD). The economic evaluation that is undertaken is a cost-benefit analysis. Thus the feasibility of the loan program is assessed by a comparing (a) the estimated economic (opportunity) costs incurred by the program with (b) the benefits (monetary value of positive social outcomes), both of which would be generated over a period of time for both the disabled loan recipients as well as other societal members affected by the financed interventions.

II. THE AFP LOAN FUND AND PROGRAM

As proposed, the Delaware Alternative Financing Program Loan Program (AFP) is to facilitate the purchase of Assistive Technologies (AT) by disabled Delaware citizens. The AT that can be obtained through the program are:

1. home environmental interventions (EI), which are mainly modifications to housing such barrier removals and ramps,
2. vehicular mobility (VM), which include new accessible motor vehicles as well as retrofitting motor vehicles with such items as automatic lifts, device carriers, modified controls, and restraint systems,
3. mobility equipment (ME) which are mechanical and electrical wheelchairs, and scooters, and
4. assistive technology devices (ATD), which are small items such as cane, walkers, crutches, and computers.

The Delaware AFP would be a jointly financed federal government and State of Delaware initiative. The major objective of federally sponsored AFP is to facilitate the purchase of Assistive Technology (AT) by disabled individuals. Currently, approximately 33 states now have such programs. The program is conducted under the federally funded Title III of the Assistive Technology Act of 1998 (AT Act). As with all states, the federal

government will provide a grant through the U.S. Department of Education, National Institute on Disability and Rehabilitation Research (NIDRR) for the State of Delaware to operate low costing AFP.

Initially, the federal AFP required a 50-50 matching rate, whereby states had to provide $1.00 in funding for each $1.00 of federal grant money. The prevailing matching rate is now 3:1 federal-state allocation, in which a state will receive $3.00 federal dollars for every $1.00 from the state. Thus the federal government grant will be a 3:1 matching rate or ratio for the provision of the Delaware loan fund. For Delaware, for every $1.00 raised, NIDRR will match it with 3 federal dollars. (The State "match" can be combination of public and private dollars). Thus, if the Delaware loan fund is the capitalized (or "seeded") with $1million dollars, the State government would commit $250,000. (Thus the match ratio 3:1 would result in $750,000 federal to $250,000). Likewise, if the AFP is endowed with $2 million, then the State's contribution must equal $500,000 to receive a federal match of $1,500,000. Similarly, an endowment of $5 million, then the State's contribution must be $1,250,000 to receive a federal match of $3,750,000.

The AFP models that have been implemented by states have been either a (a) loan guarantee fund, (b) interest buy down, and (c) a revolving fund, or a combination of these three dimensions. The predominant model has been a joint loan guarantee and interest buy down fund, with very few states adopting the revolving fund option. The proposed Delaware approach is to implement the predominant model. Under this model, the Delaware AFP fund would not directly finance the purchase of AT. Rather, the AFP is a financial support mechanism that is to foster the acquisition of AT by disabled Delaware citizens, (or their sponsors'), through commercial bank loans. The Delaware AFP fund would provide security for the commercial bank loans by loan guarantees or a buy down of the interest on the approved bank loan. Under the program, disabled Delaware citizens would apply for commercial bank loans to buy their approved AT. Whether the loan fund will employ either a loan guarantee or interest buy down, or both options, will depend on the borrower's credit risk as determined by the commercial lender.

With guaranteed loan model, the fund would help disabled applicants to qualify for loans. Since the loans would be secured or backed by a promise or guarantee that if the borrower were to default on the loan payment, the loan fund would pay the commercial lender a portion or all of the loan principal, depending on the type of guarantee. The loan

guarantees are to protect the lender from potential defaults by the borrower. With the exception of one state (Arkansas), the default rates have been zero for virtually all states, with a few having default rate ranging from 3% to 10%.

In other state programs, loan guarantees have been 75% and 100%, in which case the fund guarantees respectively a repayment of 75% and 100% of the loan principal. Typically, other states have begun their loan fund program with 100% guarantee to encourage or enhance bank participation, and in the third year, the guarantee has been relaxed to 75%. The loan guarantee program in Delaware would require that the loan fund escrow or set aside the principal value of the loan into a separate account in accordance with the loan guarantee ratio. For example, if loan guarantee is 100%, then $1.00 is set aside for every $1.00 approved in loans by the lender. Thus a $10,000 loan would entail a $10,000 escrow under a 100% guarantee. This segmentation means that the fund will be constrained in its (short-term) future operation, since the amount of total loans that can be guaranteed are decreased by the escrowed loan resources that reduce the fund's resource that are available for new loans. As the borrowers repay their loans, the amount of the escrowed loan fund resources decrease by the size of the loan payments. Loan repayments produce "recapitalization" of the loan fund with fund resources recycled into future loan guarantees for other loans.

Such recapitalization does not occur with the interest buy down, which could be used in tandem with the loan guarantee. This capability would allow the Delaware loan fund to use its financial resources to reduce the interest rate on a conventional bank loan. For example, if the prevailing interest rate for a loan is 7%, the interest costs to a borrower could be reduced to say 4%. The 3% differential would be a subsidy to a borrower, and its dollar value would be paid to the commercial lender of the loan. This approach would permit the loan fund to aid disabled individuals who had low income and/or net worth. A major impact of the interest buy down provision is that its use does permanently reduce the amount of fund resource by the amount paid out in interest costs to the lender. Consequently, the interest buy downs would permanently limit the financial capability of the loan fund.

The Delaware AFP is to be administered by a Community Based Organization (CBO). This CBO has been designated to be the Delaware Assistive Technology Initiative. The CBO will be responsible for administration of loan fund, which would entail implementation and oversight of the loan guarantees and the interest buy downs. The costs of this administration are to be financed from the loan fund's capitalization. As a result, this

needed function, which will rise in costs through the years, will curtail the financial capability of the fund to a small extent.

A brief financial profile of other states' programs between 1999 and 2002 can give some insight into what Delaware's experience is likely to be with AFP loan fund. First, on average, for their loan applications, disabled loan borrowers have had a ratio of household expenses to income at 60. Typically, commercial bank loans require a 40% to 50% ratio. Second, loan amounts have had no set limit but have fallen with the ranges $500 to $30,000. These amounts are somewhat smaller then the estimates made in the present study. Third, the interest charged to borrowers has varied 2% to 8.5%. These rates have entailed charges that are 4 points below the prime lending rates for guaranteed loans to 1% below the prime rate for non-guaranteed loans. While rates below prime could be expected for the Delaware program, predictability of specific loan charges is difficult for two reasons. Interest rates in general will change over time and considerable obstacles are encountered in making accurate predictions about their movement which would directly affect borrowers' costs (and the interest buy down). There is no available empirical evidence of how Delaware lenders will behave, though the rates in other states can be used as a guide. Fourth, the term of loans have ranged from one to ten years. Quite obviously, the longer terms have been for larger loan principal, but the implication is that such larger and longer term loans will impact the financial capability of the funds because of the need limits created by loan guarantees and interest buy downs.

III. COST BENEFIT FRAMEWORK

The objective of the AFP loan fund is to make the purchase of AT more affordable for disabled Delaware citizens, who are considered to be in need because of their low income, and/or the high financial burden that would be incurred for the purchase of EI, ME, VM and ATD. Low cost financing is to be made available for the disabled who would not qualify normally for commercial bank loans. What makes the AFP loan fund subject to governmental evaluation is that it proposes to utilize public funding, and thus, the resources of the taxpayers of State of Delaware. Thus a consideration that arises is whether the AFP loan fund produces results for Delaware society that warrant the amount of State financial support invested in the program. The more formidable approach to the evaluation of such a public policy question is cost-benefit analysis (CBA). The central criteria of CBA is that the benefits that societal member (citizens) receive from the program must exceed the costs that citizens must pay for the program. This seemingly simple criteria means that citizens in

Delaware should gain more in value from the program outcomes than it costs them in value. This perspective is analogous to private sector investment whereby when a firm/company considers a policy (investment) with its resources, the investment should generate more profit than the investment costs so that net income is earned and the firm's ownership (stockholders) is enriched, i.e., made better-off.

The CBA conducted for the AFP loan fund is an *ex ante* or prospective analysis. That is, the feasibility of the program is evaluated for whether, in the future, it would produce benefits greater than its costs if it is implemented. The length of the fund's operation is varied according to the size of its potential capitalization: 8 years for $1,000,000; 13 years for $2,000,000; 20years for $5,000,000. These time frames are based on a "crude" estimate of when the fund is likely to exhaust its endowment. (See the discussion on Program Costs). The initial year of the fund is assumed to be 2004 and the program terminates in 2023.

The analysis encompasses several considerations. First, the evaluation is limited to the costs and benefits that affect only Delaware citizens. Implications for other states are ignored. Second, the loan program is examined for three alternatives: a $1 million, a $2 million and a $5 million capitalization of the loan fund. Third, the costs of the program are identified and monetary values are assigned to them. These costs represent the opportunity costs that would be incurred by Delaware society for program implementation. (See the discussion below). Fourth, the benefits are specified. This entails the identification of the program's favorable outcomes, and putting monetary value on them. Fifth, the benefits and costs are predicted in the future to take into account the twenty-year period of the fund's operation.

Sixth, the results are discounted using a real discount rate. That is, the selected discount rate is not the nominal interest rate, which includes the value of the inflation rate. As a result of employing a real rate, the predicted costs and benefits are also measured in real terms, i.e., without forecasting the inflation-increased value of the benefits and costs. Thus, the initial values per unit of the benefits and costs are used, with their predicted annual values changing according to the increase in the number of cost units or outcome units. Discounting is undertaken for two interrelated reasons. The benefits and costs are valued less in the future by society simply because gains and loss in the present and near present have more impact and relevance to individuals. Correlatively, discounting allows a determination whether the money the State's invests in the AFP would realize greater gains than would be obtained with

leaving the investment moneys in the private sector. Consistent with this argument, the discount rate reflects the trade-off of government's use of society's moneys for future gain versus society's use of that investment money for current consumption or savings.

Seventh, the discounted annual values of (called the stream of costs and benefits) are summed separately and two figures are calculated. The net present value (NPV) of the two streams (an approach preferred by economist) is derived. NPV is equal to the difference between the discounted benefits and the discounted costs. Where the benefits are greater than the costs, then the NPV is positive and the program is worth undertaking, --equivalently a "profit" is made, —and the program should be financed. A benefit cost (B:C) ratio could be derived, in which discounted benefits are divided by the discounted costs. If the B:C ratio is greater than 1:1, then the same interpretation applies as to a positive NPV.

Eighth, a sensitivity analysis is undertaken for the (discounted) estimates of costs and benefits. That is, the cost and benefits estimates are evaluated to determine whether the CBA results would change under different conditions. This has encompassed three types of analyses. It has entailed using variations in the estimate of the costs; $1million versus $2million versus $5 million. On the benefit side, it has involved consideration of the estimation of a different number of disabled who would work as a result of receiving loans. A particular consideration in the present analysis is that social, economic, and demographic data for calculating the costs and benefits were not directly available for Delaware; as a result, national and non-Delaware data had to be employed and applied to the Delaware situation. Such analysis does leave room for some uncertainty. Finally, the calculation of both cost and benefit the streams were discounted at a wide range of discount (interest) rates to determine whether the costs and benefit estimates vary widely to ascertain whether the NPV remains positive. The present analysis has used discount rates ranging from 1 % to 6%.

A. <u>Program Costs</u>

According to CBA, the appropriate costs of the AFP are the opportunity costs of undertaking the program. Opportunity costs entail several dimensions. The opportunity costs is the <u>incremental</u> (additional or "new") social costs that would be incurred to implement the AFP. These costs could encompass both any financial resources and the value of non-financial resources (time, volunteer effort, contributed activities and capital) that would be employed on program activities. If financial and non-financial resources were used, they would not be available for alternative uses. Therefore society is hindered from

producing any alternative public and private goods, the consumption of which citizens now forego and thus incur a loss of their value.

Table 1 provides a number of expenditure items involving the AFP, but only some of which are opportunity costs. Four social costs for the proposed Delaware participation in the Federal Alternative Financing Program for individuals with disabilities have been included in the present analysis.

Table 1
OPPORTUNITY COSTS OF THE AFP

Item	Opportunity Costs	Measurement	Time Period	Significant Note
Capitalization costs of the AFP loan fund	YES	$1,000,000 $2,000,000 $5,000,000	First year of the program	
Interest Earned by AFP investments	NO	None	All 20-years of program	Transfers between fund and payer of interest
AFP Administration Costs by CBO	YES	$60,487	All 20-years of program, increase by 2% annually for financial analysis	Paid by Loan Fund and thus included in loan capitalization
Consumer counseling evaluation costs,	YES	$180.00 for each loan ($90.00/hour for average 2 hour session).	All 20-years of program	
Bank Loan Cost	YES	Principal Value of Loans	All 20-years of program	
Interest Paid by borrowers	NO	None	All 20-years of program	Transfers between borrowers and banks
Any additional tax burden from financing the loan fund	NO	Costs to society above revenues collected (Excess Burden)	Not included in the analyses	AFP financed with existing taxes
Cost of training for individual and care providers	YES	Data not available	Not included in the analyses	small costs
Cost of follow-up services	YES	Data not available	Not included in the analyses	small costs
Cost of maintenance/warranties	YES	Data not available	All 20-years of program	Subsumed under loan costs

1. Loan Fund Capitalization

A major opportunity cost of Delaware AFP is the capitalization of the loan fund. The present analysis conducted on the basis that a joint federal and State government provide the proposed loan fund with a $1 million, $2 million and $5 million endowment. Given the 3:1 federal-state match, for the $1 million the State of Delaware would pay $250,000 and for the latter it would appropriate $500,000. These capitalizations are opportunity costs in the first year of the program because once the endowment is made; Delaware is denied the use of such resources for any other purposes. The loan fund will be permitted to invest both the encumbered loan guaranteed resources and the non-encumbered moneys. No opportunity cost is occurring, however, since the interest earned by the fund is merely a transfer. The interest earned is offset equally by the institutions (banks, bonds issuers) that pay the interest.

2. The CBO Administrative Costs

These costs are incurred to manage the operations of the loan fund. The annual 20-year costs were not counted separately, because they are to be subsumed under the fund endowment. That is, they are to be paid from the fund's endowed resources whose opportunity cost has already been measured. Thus they are merely financial outlays. The initial administrative costs of $60,487 were provided by the CBO. The costs include $48,390 of direct costs (or 25% of the direct costs as an overhead charge).

3. Consumer Counseling Evaluation Costs (CCE)

Consumer counseling cost is incurred for an evaluation that each loan recipient must undergo in order to have a loan approved. The evaluation is to determine the efficacy and appropriateness of the AT for which the loan is requested. The cost for each evaluation is estimated to be $180.00. This is an average figure derived from estimates of: $90.00 for each hour of evaluation that could range from one to four hours to conduct. (See the "A Progress Report" by the Delaware Assistive Technology Policy Committee, January 22, 2003). CCE are opportunity costs, since the borrower can no longer uses the financial outlays for any other purposes.

4. Bank Loan Costs

Only the principal of the loans has been allocated as AFP opportunity costs. The interest costs for the loans have not been counted as social costs. Interest costs are offsetting transfer payments among two groups. The borrowers' interest payments to the bank, which

are the loss to a borrower, are equal to the interest payments received by the bank, which are a gain to those institutions.

An important issue in obtaining the annual loan costs of the AFP over 20 years is the determination of (a) the number of loans that would be given, (b) the types of loan (or purposes: EI, VM, ME, ATD), and (c) the size of the loans which vary by the types of loans. The number and types of loans predicted over the 20 years of the fund's operation are given in Table 2. The analyses of the number of loans and the types of loan have been based on the experiences of AFP in other states. The analysis of the size of the loans has been drawn from Delaware data. Estimates of loan size are shown on Table 2 by the types of AT to be purchased. Because of the complexity of the calculations, the analyses are given in the appendix in "Steps in Costs Calculations".

Table 2
NUMBER OF PREDICTED LOANS

	A. Number and Types of Loans										
	No. of New Loans					Replacement Loans					Total
Year	VM	EI	ME	ATD	Total	VM	EI	ME	ATD	Total	
2004	6	2	4	6	18						18
2005	6	2	4	7	19						19
2006	6	2	4	7	19						19
2007	6	2	4	7	19						19
2008	6	2	4	7	19						19
2009	6	2	4	7	19						19
2010	6	2	4	7	19			4	6	10	29
2011	6	2	4	7	19			4	7	11	30
2012	6	2	4	7	19			4	7	11	30
2013	6	2	5	7	20			4	7	11	31
2014	6	2	5	7	20	6		4	7	17	37
2015	6	2	5	7	20	6	2	8	7	23	43
2016	6	2	5	7	20	6	2	8	7	23	43
2017	6	2	5	7	20	6	2	8	7	23	43
2018	6	2	5	7	20	6	2	8	14	30	50
2019	7	2	5	7	20	6	2	9	14	31	51
2020	7	2	5	7	21	6	2	9	14	31	52
2021	7	2	5	7	21	6	2	9	14	31	52
2022	7	2	5	8	21	6	2	9	14	31	52
2023	7	2	5	8	21	6	2	9	14	31	52

B. Expected Size of Loans in 2004				
	VM	EI	ME	ATD
2004	$15,000	$6,700	$4,600	$1,000

VW: Vehicle Mobility; EI: Environmental Intervention; ME: Mobility Equipment; ATD Assistive Technology Devices.

5. Tax Burden

The value of tax revenues to finance the program is already measured once in the capitalization of the AFP loan fund. There is a question, however, about any additional social costs due to taxation. All taxes cause a loss in value greater than the size of revenues collected. (These are called excess burden or deadweight loss). Such losses would be attributed to the Delaware AFP loan fund only if taxes were to be increased to finance the program. Since, however, existing revenues are to be employed for financing, then there is no additional excess burden, and thus no additional opportunity costs to be counted.

The size of the capitalization of the fund affects it costs (it also in turn determine the benefits that can be produced by the AFP). Simply, the amount of available endowment constrains the fund's capacity to support the total value of loans. This can be seen from Table 3. The table presents loan fund commitment under the assumption of merely a 100% guarantee for the entire period. This perspective does not take into account any interest buy downs or loan defaults that would "deplete the fund's fiscal capability". Also, the analysis does not include consideration of any interest earned on the encumbered and unencumbered moneys of the fund. The interest earnings would add revenues and therefore permit the extension of the AFP efforts.

1. The table displays all the loans both new and replacement loans predicted over a 20 year period (Column B).
2. The annual costs of the number of loans are in Column C.
3. Column D is the cumulative annual total of all subsequent loans. It indicates the loan fund's commitments for guarantees before the repayment of loans in any year.
4. Column E is the expected administrative cost which predicted to grow by 2% annually. (See the appendix).
5. Column F merely adds the administrative costs to the accumulated commitments of the fund before loan repayments.
6. Column G shows the expected loan repayments. The payments to the banks permits the release of moneys escrowed for the guarantees. In effect, the repayments allow recapitalization of the fund.

7. Column H is the total fund commitment on an annual basis that takes into account the released moneys from loan repayments.

As presented by highlighted areas of the table, this approximation of the financial operations of the loan fund indicates the limitations of the size of the capitalization. First, if a $1,000,000 capitalization occurs, the fund would have an upper limit of 8 years, and would be in need of replenishment. Second, the fund's life would be five years longer with a $2,000,000 capitalization. A $5,000,000 capitalization would provide a 20-year life of operation. These three spans of time have been the basis of the analysis of the benefits of the AFP.

Table 3
PREDICTED AFP LOAN FUND OPERATIONS: ALL LOANS

A	B	C	D	E	F	G	H
Year	Total No. of All Loans	Total Annual Costs Of Loans	Accumulated Commitments Before Repayments	Admin. Costs	Total Loan GTD Before Repayments	Loan Repayments	Total Fund Commitment After Repayment
			(Sum of Annual Loans in C)		(D + E)		(F – H)
2004	18	$122,778	$122,778	$60,487	$183,265		
2005	19	$126,305	$249,083	$61,697	$310,779	$24,556	$286,223
2006	19	$127,189	$376,271	$62,931	$439,202	$49,817	$389,385
2007	19	$128,079	$504,351	$64,189	$568,540	$75,255	$493,285
2008	19	$128,976	$633,326	$65,473	$698,799	$100,871	$597,928
2009	19	$129,878	$763,205	$66,783	$829,987	$126,666	$703,321
2010	29	$155,188	$918,392	$68,118	$986,511	$128,086	$858,425
2011	30	$157,103	$1,075,495	$69,481	$1,144,976	$133,863	$1,011,113
2012	30	$158,025	$1,233,521	$70,870	$1,304,391	$139,846	$1,164,545
2013	31	$158,953	$1,392,474	$72,288	$1,464,762	$145,835	$1,318,927
2014	37	$249,888	$1,642,362	$73,733	$1,716,096	$151,831	$1,564,265
2015	43	$282,630	$1,924,992	$75,208	$2,000,200	$175,833	$1,824,367
2016	43	$283,578	$2,208,570	$76,712	$2,285,282	$201,321	$2,083,961
2017	43	$284,532	$2,493,102	$78,246	$2,571,349	$226,616	$2,344,733
2018	50	$292,494	$2,785,596	$79,811	$2,865,407	$254,917	$2,610,490
2019	51	$298,062	$3,083,658	$81,408	$3,165,065	$281,625	$2,883,440
2020	52	$299,037	$3,382,694	$83,036	$3,465,730	$291,259	$3,174,471
2021	52	$300,018	$3,682,713	$84,696	$ 3,767,409	$294,540	$3,472,869
2022	52	$301,007	$3,983,719	$86,390	$4,070,110	$297,828	$3,772,282
2023	52	$302,002	$4,285,722	$88,118	$4,373,840	$298,123	$4,075,717

B. Program Benefits

The AFP could produce considerable positive outcomes, or impacts, for Delaware society. More specifically, the loans to disabled individuals could permit the realization of gains directly to borrowers as well as non-borrowers, e.g., caregivers and indirectly citizens

as consumers of goods and services and as taxpayers. The monetary value of these positive outcomes is the benefits that could be obtained. There are numerous benefits that could be generated by the AFP. A large, but not exhaustive, list of potential outcomes and benefits are given on Table 4. Many of these outcomes are not easily subject to measurement or quantification. For those that can be quantified, substantial difficulty is encountered in translating the outcomes into monetary values.

Table 4
POTENTIAL BENEFITS AND OUTCOMES OF AFP

OUTCOMES	**Benefit Measurement**	**Data sources**	**Beneficiaries** **1. Borrowers** **2. State (more taxes collected)** **3. Citizens** **4. Caregivers**
1. EMPLOYMENT			
A. New full-time work for borrower	Amount of earnings in dollars	U.S. Census, ATAP	1, 2, 3
B. New part-timework for borrower	Amount of earnings in dollars	U.S. Census, ATAP	1, 2, 3
C. Additional work-time for existing working disabled	Amount of earnings in dollars	Not estimated, No data available	1, 2, 3
D. New full-time work for caregiver	Amount of earnings in dollars	Not estimated, No data available	2, 3, 4
E. New part-time work for caregiver	Amount of earnings in dollars	Not estimated, No data available	2, 3, 4
F. Additional work-time for existing working caregiver	Amount of earnings in dollars	Not estimated, No data available	2, 3, 4
2. HEALTH CARE COST SAVINGS			
A. Outpatient medical costs avoided for disabled	Savings of financial costs	Not estimated, No data available	1, 2, 3, 4
B. Inpatient medical costs avoided for disabled	Savings of financial costs	Not estimated, No data available	1, 2, 3, 4
C. Reduced home care utilization for disabled (nursing, case manager, speech pathology, occupational therapy, physical therapy, personal care attendant)	Savings of financial costs	Not estimated, No data available	1, 2, 3, 4
D. Nursing home expenses avoided for disabled	Savings of financial costs	Not estimated, No data available	1, 2, 3, 4
E. Avoidance of institutionalization (long-term care) for disabled	Savings of financial costs	Not estimated, No data available	1, 2, 3, 4

F. Reduced costs from injury prevention: falls of disabled	Savings of financial costs	Not estimated, No data available	1, 2, 3, 4
G. Reduced costs from injury prevention: falls of caregivers	Savings of financial costs	Not estimated, No data available	1, 2, 3, 4
H. Reduced costs from injury prevention: back problems from lifting/carrying disabled	Savings of financial costs	Not estimated, No data available	1, 2, 3, 4
I. Missed work of caregivers from falls and other injuries	Savings of financial costs	Not estimated, No data available	1, 2, 3, 4
J. Additional dependent care expenses for falls and other injuries	Savings of financial costs	Not estimated, No data available	1, 2, 3, 4
3. QUALITY OF LIFE IMPROVEMENTS			
A. Increased participation in home and community activities (Less isolation)	Intangible	Not estimated, No data available	1
B. Improved mental health by disabled	Intangible	Not estimated, No data available	1
C. Increased independence control by disabled	Intangible	Not estimated, No data available	1
D. Increased self-esteem by disabled	Intangible	Not estimated, No data available	1
E. Increased life satisfaction by disabled	Intangible	Not estimated, No data available	1
F. Increased physical functioning by disabled	Intangible	Not estimated, No data available	1
G. Pain reduction of disabled	Intangible	Not estimated, No data available	1
H. Greater physical stability by disabled	Intangible	Not estimated, No data available	1
I. Avoidance of increased morbidity: :slowing of functional decline	Intangible	Not estimated, No data available	1
J. Increased stamina and endurance by disabled	Intangible	Not estimated, No data available	1
K. Caregiver's time savings used for non-work activities	Intangible	Not estimated, No data available	2, 3, 4
L. Respite periods by caregivers: avoidance of burnout	Intangible	Not estimated, No data available	4
M. Reduced dependence on specialized transport (rented vans, ambulances for medical treatment)	Intangible	Not estimated, No data available	1, 4

As indicated by Table 4, several benefits have been have been employed for the present analysis. First, the earnings from increased full-time and part-time employment by borrowers

have been calculated. Second, the financial savings of medical costs from falls that are prevented for the disabled borrowers and caregivers have been estimated.

1. Employment Gains

Society could make considerable gain through the AFP if unemployed disabled borrowers, because of their AT purchases, would find gainful employment. Such employment would not only compensate the working disabled, but also increase economic productivity of the State through their contribution to the profits of their employers, and secondarily contribute tax revenues of the State government (primarily, personal income taxes--PIT) and to Delaware local governments. The employment of the disabled could mean a reduction in the amount of public benefits that are paid to these individuals. However, from the perspective of CBA these are not (incremental) gains, but rather transfer payments between the disabled recipients and the State (and their citizen taxpayers), and as such, they merely are offsets in which the receipt and payment cancel out each other.

Because of the complexity of the calculation involving estimates derived from U. S. Census data and other sources, the steps undertaken are described in an appendix. Estimates are provided for both part-time and full-time employment. Two different calculations of potential earnings from the new employment (i.e., they did not obtain employment until and due to the AFP loan). One calculation is based on an employment rate of 55% of the new loans that would be given each year. That is, as shown on Table 5, 55% of all individuals who receive loans will seek employment. This proportion is derived from a survey of disabled conducted for the National Organization on Disability.[1] A more conservative calculation is based on an employment rate of 28% of all the estimated annual new loans that would be granted. The data for this perspective is taken from that Alternative Technical Assistance Financing Project (AFTAP), which monitors the AFP for participating states.[2] These two estimates have been utilized because of a lack of consensus from limited available empirical evidence about the extent of the willingness of the disabled to seek work.

[1] National Organization on Disability, (1994a). Closing the gap: America's challenge, The N.O.D./Harris survey of Americans with disabilities—A summary. New York: National Organization on Disability; National Organization on Disability, (1994b). N.O.D./Harris survey of Americans with disabilities—A summary. New York NY: Louis Harris and Associates. Both are cited in Chartbook on Work and Disability in the United States, 1998, prepared by Susan Stoddard, Lita Jans, Joan M. Ripple, and Lewis Kraus, U. S. Department of Education, National Institute on Disability and Rehabilitation Research, Washington, D.C.

[2] Follow-up, Alternative Fin7ancing Technical Assistance Project, ATAP/RESNA, Library, http://www.resna.org/ATAP/

Table 5
PREDICTED NEW LOANS RESULTING IN EMPLOYMENT

YEAR	Total New Loans	New Loans: 55% Employment			New Loans: 28% Employment		
		Full-time	Part-time	Total FT & PT	Full-time	Part-time	Total FT & PT
2004	18	6	4	10	3	4	7
2005	19	6	4	10	3	4	7
2006	19	6	4	10	3	4	7
2007	19	6	4	10	3	4	7
2008	19	6	4	10	3	4	7
2009	19	6	4	10	3	4	7
2010	19	6	4	10	4	4	8
2011	19	6	4	10	4	4	8
2012	19	6	4	10	4	4	8
2013	20	6	4	10	4	4	8
2014	20	6	4	10	4	4	8
2015	20	6	4	10	4	4	8
2016	20	6	4	10	4	4	8
2017	20	6	4	10	4	4	8
2018	20	6	4	10	4	4	8
2019	20	6	4	10	4	4	8
2020	21	6	4	10	4	4	8
2021	21	6	4	10	4	4	8
2022	21	7	4	11	4	4	8
2023	21	7	4	11	4	4	8

After the number of loans associated with entry in the workforce was determined, the average of the potential workers was ascertained to estimate the worklife expectancy of the potential workers. With an average age of 45 years old (AFTAP)[3], the potential workers were determined to have a 15 additional years of expected worklife (60 years old minus 45 years of age). Then, annual earnings were assigned to both full-time and part-time workers (respectively $23, 244 and $4,656) based on U. S. Census data for earnings by disabled employed at their initial entrance into the labor market (18 to 24 years of age). The earnings for both groups were assumed to increase, a productivity factor, at a rate of 2% annually over the 15 year worklife.

2. Prevention of Falls

A second benefit that has been estimated is that potential cost savings that could be obtained by preventing falls among both the disabled borrowers and their caregivers. There is very mixed evidence that AT health care interventions reduce falls among the disabled.

[3] Main Survey, Alternative Financing Technical Assistance Project, ATAP/RESNA, Library, http://www.resna.org/ATAP/

(See the AARP Review, AARP, 2002).[4] Specifically some studies indicate that falls may be mitigated by AT while other studies offer no empirical support. In the disabilities literature, however, there are strong and vociferous arguments that fall and AT interventions are negatively related, with both the disabled individuals and their caregivers being subjected to falls that could be avoid if AT were put in place. Consequently, a very conservative approach to this association has been taken in the present study. It is assumed that for each year of the twenty-year AFP, at least one disabled borrower and one caregiver would avoid a fall and the health care consequences. The value of an avoided fall is taken from an AARP estimate (derived by the Lewin Health Group)[5] of the Delaware medical care costs ($14,788 in 2004) of a fall (of an individual of any age) that leads to an emergency room admission, and requires short-term and institutional medical attention (i.e., expenditures on physician, nursing, inpatient, outpatient and home care services). Details of the calculations are presented in the appendix.

IV. Estimates of Benefits and Costs

The results of the CBA for the different alternatives and sensitivity analyses are presented on Tables 6 through 11. As can bee seen in the tables, the implementation of the AFP should be an efficient program, irrespective of the alternatives and sensitivity analyses considered. The analysis produces all positive net present values (NPV) and Benefit-Costs (B/C) Ratios under (a) the three capitalization alternatives -$1,000,000, $2,000,000 and $5,000,000 capitalization of the AFP, and the (b) sensitivity analyses of the proportion of loans that induce employment, --28% and 55% of loan recipients--, and under all discount rates ranging from 1% through 6%. What is clear is that, despite the higher opportunity costs, the $5,000,000 capitalization generates the largest total amount of net benefits, i.e., NPV, even though the B/C ratios are lower, at the 2:2 range, than the other capitalization alternatives.

The NPV and the B/C Ratios for the $1,000,000 and $2,000,000 capitalization are quite large. (See Tables 6 through 9). The estimates are substantial under both capitalizations, and over the wide range of interest rates associated with the higher

[4]Kochera, A. (2002), Falls Among Older Persons and the Role of the Home: Analysis of Cost, Incidence, and Potential Savings from Home Modification, AARP Public Policy Issue Brief, March , http://fresearch.aarp.org/il/ib56_html

[5] IBID.

expectation of employment at 55% of all loans. Here the NPVs vary from $9.8. million to $33.0 million, and the B/C ratios range from 5.5:1 to 9.3:1. With the more conservative view that only 28% of all loans would lead to the disabled being employed, the estimates of NPV and B/C ratios are still considerable under all discount rates. Here the estimates vary from $9.6 million to $26.6 million and the B/C ratios are between 3.6:1 to 7.3:1.

However, while the results are positive for the $5,000,000 capitalization, gains are predicted to be considerably lower under the higher discount rates. The NPV for discount rates of 4% through 6% vary from $13 million to $9 million for the 55% loan employment scenario, which is quite large, but for the equivalent rates with the 28% loan employment perspective the NPV estimates drop to a range of $8 and $6 million, and the B/C ratios fall to a range of 1.9:1 and 6.7:1.

Table 6
$1 MILLION CAPITALIZATION, 8 YEAR FUND OPERATION, 55% OF LOANS FOR INDIVIDUALS WHO WOULD GO TO WORK

	Discount Rates					
	1%	2%	3%	4%	5%	6%
A. SOCIAL (0PPORTUNITY) COSTS (Total Includes 1, 2, 3)	$2,076,160	$2,047,551	$2,020,435	$1,994,692	$1,930,047	$1,900,581
1. Loan Fund Capitalization	Federal grant = $750,000 State commitment = $250,000					
2. Consumer Evaluation	Evaluation of Consumer (client) for the appropriateness of the AT for which loan is to be made ($90/hour for average of 2 hours = $180.00)					
3. Bank Loans	New loans range from 18 to 21 each year over 20Yrs. When AT are replaced after obsolescence, additional loans are made in the future (beginning in year 2010), so an additional number of "replacement" loans (10-31) are added to new loans.					
B. BENEFITS (Total 4, 5)	$19,120,420	$16,815,211	$14,853,347	$13,177,193	$11,738,544	$10,546,345
4. Work Income	$18,581,371	$16,321,928	$14,400,127	$12,759,160	$11,351,539	$10,185,689
5. Health care costs saved (Falls)	$539,049	$493,283	$453,220	$418,033	$387,005	$360,656
C. NPV (Benefits minus Costs)	17,044,260	14,767,660	12,832,911	11,182,501	9,808,496	8,645,764
D. Benefits Costs Ratios (B:C = B/C)	9.2:1	8.2:1	7.4:1	6.6:1	6.1:1	5.6:1

Table 7
$1 MILLION CAPITIALIZATION, 8 YEAR FUND OPERATION, 28% OF LOANS FOR INDIVIDUALS WHO WOULD GO TO WORK

	Discount Rates					
	1%	2%	3%	4%	5%	6%
A. SOCIAL (0PPORTUNITY) COSTS (Total Includes 1, 2, 3)	$2,076,160	$2,047,551	$2,020,435	$1,994,692	$1,930,047	$1,900,581
1. Loan Fund Capitalization	Federal grant = $750,000 State commitment = $250,000					
2. Consumer Evaluation	Evaluation of Consumer (client) for the appropriateness of the AT for which loan is to be made ($90/hour for average of 2 hours = $180.00).					
3. Bank Loans	New loans range from 18 to 21 each year over 20Yrs. When AT are replaced after obsolescence, additional loans are made in the future (beginning in year 2010), so an additional number of "replacement" loans (10-31) are added to new loans.					
B. BENEFITS (Total 4, 5)	11,690,835	10,537,559	9,529,861	8,646,782	7,870,105	7,216,813
4. Work Income	11,151,786	10,044,275	9,076,641	8,228,749	7,483,100	6,856,157
5. Health care costs saved (Falls)	$539,049	$493,283	$453,220	$418,033	$387,005	$360,656
C. NPV (Benefits minus Costs)	$9,614,675	$8,490,007	$7,509,426	$6,652,090	$5,940,058	$5,316,232
D. Benefits Costs Ratios (B:C = B/C)	5.6:1	5.2:1	4.7:1	4.3:1	4.1:1	4.8:1

Table 8
$2 MILLION CAPITIALIZATION, 13 YEAR FUND OPERATION, 55% OF LOANS FOR INDIVIDUALS WHO WOULD GO TO WORK

	Discount Rates					
	1%	2%	3%	4%	5%	6%
A. SOCIAL (0PPORTUNITY) COSTS (Total Includes 1, 2, 3)	$4,139,008	$4,017,375	$3,906,276	$3,804,719	$3,636,150	$3,551,924
1. Loan Fund Capitalization	Federal grant = $1,500,000 State commitment = $500,000					
2. Consumer Evaluation	Evaluation of Consumer (client) for the appropriateness of the AT for which loan is to be made ($90/hour for average of 2 hours = $180.00).					
3. Bank Loans	New loans range from 18 to 21 each year over 20Yrs. When AT are replaced after obsolescence, additional loans are made in the future (beginning in year 2010), so an additional number of "replacement" loans (10-31) are added to new loans.					
B. BENEFITS (Total 4, 5)	$37,701,777	$33,137,126	$29,253,463	$25,936,344	$23,090,074	$20,732,028
4. Work Income	$37,162,727	$32,643,843	$28,800,243	$25,518,311	$22,703,070	$20,371,372
5. Health care costs saved (Falls)	$539,049	$493,283	$453,220	$418,033	$387,005	$360,656
C. NPV (Benefits minus Costs)	$33,562,768	$29,119,751	$25,347,187	$22,131,625	$19,453,925	$17,180,103
D. Benefits Costs Ratios (B:C = B/C)	9.1:1	8.3:1	7.5:1	6.8:1	6.4:1	5.8:1

Table 9
$2 MILLION CAPITALIZATION, 13 YEAR FUND OPERATION, 28% OF LOANS FOR INDIVIDUALS WHO WOULD GO TO WORK

	Discount Rates					
A. SOCIAL (0PPORTUNITY) COSTS (Total Includes 1, 2, 3)	1%	2%	3%	4%	5%	6%
1. Loan Fund Capitalization	$4,139,008	$4,017,375	$3,906,276	$3,804,719	$3,636,150	$3,551,924
2. Consumer Evaluation	Federal grant = $1,500,000 State commitment = $500,000					
3. Bank Loans	Evaluation of Consumer (client) for the appropriateness of the AT for which loan is to be made ($90/hour for average of 2 hours = $180.00).					
	New loans range from 18 to 21 each year over 20Yrs. When AT are replaced after obsolescence, additional loans are made in the future (beginning in year 2010), so an additional number of "replacement" loans (10-31) are added to new loans.					
B. BENEFITS (Total 4, 5)	$30,154,649	$25,603,939	$21,883,080	$18,824,338	$16,293,565	$14,235,840
4. Work Income	$29,615,600	$25,110,656	$21,429,860	$18,406,305	$15,906,560	$13,875,184
5. Health care costs saved (Falls)	$539,049	$493,283	$453,220	$418,033	$387,005	$360,656
C. NPV (Benefits minus Costs)	$26,015,641	$21,586,564	$17,976,805	$15,019,619	$12,657,415	$10,683,915
D. Benefits Costs Ratios (B:C = B/C)	7.3:1	6.4:1	5.6:1	5.0:1	4.5:1	4.0:1

Table 10
$5 MILLION CAPITALIZATION, 20 YEAR FUND OPERATION, 55% OF LOANS FOR INDIVIDUALS WHO WOULD GO TO WORK

	Discount Rates					
	1%	2%	3%	4%	5%	6%
A. SOCIAL (0PPORTUNITY) COSTS (Total Includes 1, 2, 3)	$8,962,419	$8,607,911	$8,281,140	$7,995,243	$7,619,634	$7,398,422
1. Loan Fund Capitalization	Federal grant = $3,750,000 State commitment = $1,250,000					
2. Consumer Evaluation	Evaluation of Consumer (client) for the appropriateness of the AT for which loan is to be made ($90/hour for average of 2 hours = $180.00).					
3. Bank Loans	New loans range from 18 to 21 each year over 20Yrs. When AT are replaced after obsolescence, additional loans are made in the future (beginning in year 2010), so an additional number of "replacement" loans (10-31) are added to new loans.					
B. BENEFITS (Total 4, 5)	$59,770,168	$50,714,530	$43,312,890	$37,230.602	$32,200,093	$28,110,997
4. Work Income	$59,231,119	$50,221,247	$42,859,670	$36,812,569	$31,813,088	$27,750,241
5. Health care costs saved (Falls)	$539,049	$493,283	$453,220	$418,033	$387,005	$360,656
C. NPV (Benefits minus Costs)	$50,268,700	$41,613,336	$34,578,530	$28,817,326	$24,193,454	$20,351,919
D. Benefits Costs Ratios (B:C = B/C)	6.7:1	5.9:1	5.2:1	4.7:1	4.2.:1	3.8:1

Table 11
$5 MILLION CAPITALIZATION, 20 YEAR FUND OPERATION, 28% OF LOANS FOR INDIVIDUALS WHO WOULD GO TO WORK

	Discount Rates					
A. SOCIAL (0PPORTUNITY) COSTS (Total Includes 1, 2, 3)	1%	2%	3%	4%	5%	6%
1. Loan Fund Capitalization	$8,962,419	$8,607,911	$8,281,140	$7,995,243	$7,619,634	$7,398,422
2. Consumer Evaluation	Federal grant = $3,750,000 State commitment = $1,250,000					
3. Bank Loans	Evaluation of Consumer (client) for the appropriateness of the AT for which loan is to be made ($90/hour for average of 2 hours = $180.00).					
	New loans range from 18 to 21 each year over 20Yrs. When AT are replaced after obsolescence, additional loans are made in the future (beginning in year 2010), so an additional number of "replacement" loans (10-31) are added to new loans.					
B. BENEFITS (Total 4, 5)	$30,154,649	$25,603,939	$21,883,080	$18,824,338	$16,293,565	$14,235,840
4. Work Income	$29,615,600	$25,110,656	$21,429,860	$18,406,305	$15,906,560	$13,875,184
5. Health care costs saved (Falls)	$539,049	$493,283	$453,220	$418,033	$387,005	$360,656
C. NPV (Benefits minus Costs)	$20,653,181	$16,502,745	$13,148,720	$10,411,062	$8,286,926	$6,476,762
D. Benefits Costs Ratios (B:C = B/C)	3.3:1	2.9:1	2.6:1	2.3:1	2.1:1	1.9:1

APPENDIX

APPENDIX A
Steps in Social Cost Analysis

The detailed steps undertaken to calculate the relevant opportunity costs are presented immediately below.

I. LOAN FUND CAPITALIZATION.

Determine the opportunity cost of the Loan Fund for twenty years—the life of the financing program.

1. It is the amount of the initial endowment.
2. Two potential endowments are considered: $1,000,000 and $2,000,000.

II. CBO ADMISTRATIVE COSTS.

The administrative costs of the loan fund is to be paid from the resources of the fund and thus the opportunity costs of this administrative function is subsumed under the opportunity costs of the entire endowment.

III. TAX BURDEN.

The additional burden of taxation to finance the loan fund is assumed to negligible, because the State spending on the Loan fund is to be made from existing State funds. That is, no new tax revenues are expected to be raised to support the proposed program.

IV. LOAN COSTS.

A. Estimate the growth rate in disabled population of Delaware.

1. Determine the number of disabled persons in Delaware in the year 2000, as defined by the US Census.[6]
2. Determine the number of disabled persons in Delaware in the year 1990, as defined by the US Census.[7]
3. Calculate the annual percentage change (growth) in number of disabled between 1990 and 2000.

B. Estimate the number of disabled individuals in Delaware who would be potentially eligible for program participation for each year of the program.

[6] Disability Status by Sex: 2000, Census 2000 Summary File 3 (SF3) –Sample Data; http://factfinder.census.gove/servlet/QTTABLE?_ts = 711495378

[7] Disability, 1990 Census Table 3, U.S. Census Bureau, 2000. http://factfinder.census.gove/servlet/QTTABLE?_ts = 711495378

1. Determine the size of the disabled population in Delaware in the year 2000 who would be the potential target population of the program. This requires removal of individuals with mental disablement from the total number of disabled individuals in the year 2000 figures.[8]
2. Use the annual percentage change or growth of disabled population (see step II) to extrapolate the size of the disabled population in Delaware in 2004, the expected beginning of the loan program, and for the next twenty years thereafter until 2023.

C. Estimate the number of Delaware Loans in the initial year of the program.

1. Loans per disability population of other states with small populations (2 million or less) in the year 2000. This is calculated to equal the number of loans of each state in 2000[9] divided by the disabled population (excluding mental health disability) in year 2000.[10]
2. Average number of loans proportional to the disabled population of all selected small states ("the Loan Factor"). This figure is derived by adding the separate values of loans per disability population of each state and dividing that summary figure by the number of selected states.
3. Multiply the Loan Factor by the Delaware disabled (less mental disablement) population of Delaware to produce the number of new loans in the initial year of the program, --i.e., year 2004 and the number of new loans for the subsequent years of the 20 year program.
4. On a periodic basis, a number of additional loans are added to the annual new loan figures. These additions are for refurbishment of AT that has undergone obsolescence due wear and tear and quality improvements. (See below).

D. Estimation of the Costs of Loans.

1. Annual allocation of loans by purpose. The number of loans has been allocated according to four purposes for which loan funds were used. The four AT categories are: vehicle mobility (VM) -- 32%, environmental improvements (EI)—9%, mobility equipment (ME)—23%, and other AT devices (ATD)—36%. This allocation is based upon surveys of loan participants from 1999 to

[8] Disability Status by Sex: 2000, Census 2000 Summary File 3 (SF3) –Sample Data; http://factfinder.census.gove/servlet/QTTABLE?_ts = 711495378
[9] Alternative Financing Technical Assistance Project, ATAP/RESNA, Library, http://www.resna.org/ATAP/
[10] Disability Status by Sex: 2000, Census 2000 Summary File 3 (SF3) –Sample Data; http://factfinder.census.gove/servlet/QTTABLE?_ts = 711495378

2002 in other states for the Federal Alternative Financing Program for individuals with Disabilities.[11]

2. Costs for each type of AT. VM costs were estimated to be $15,000 per loan, based on a midpoint estimate of $10,000 to $20,000. EI costs were estimated to be $6,700, based on separate ranges of cost for ramps ($7,500 to $9,900) and lofts (3,500 to $5,000). That is, $6,700 is the midpoint value between $3,500 and $9,900. VM and EI estimates were obtained form the Division of Vocational Rehabilitation within the Delaware Department of Labor. ME were based on a range of wheelchair costs that were obtained from manufacturers. The cost range from $320 for a "lightweight manual wheelchairs" to average power chair with tilt at $9,000. (Some types of power chairs had a price of $30,000). The midpoint estimate is $4,660. ATD loans were estimated to be an average of $1,000 based on a review of the AT literature and the ATAP surveys.[12]

E. Determination of loans for replacement of AT that has reached its technical duration.

1. VM, EI, ME, and ATD have life cycle of usefulness, and need to be replaced through out the twenty-year time span of the Loan program. The technical duration of VM is 10 years, EI with 11 years, ME with 7 years and ATD with 6 years (Andrich, 1998).
2. The number of loans for replacement was estimated to occur for the later years of the program according to the original purpose of the loans.
3. Costs of "replacement" loans. The loan costs were estimated with the same figures as new loans.

V. CONSUMER COUNSELING EVALUATION COSTS.

Counseling charges have been determined to be $90 per hour with an average of two hours to complete the evaluation of a disabled person for his her compatibility with the particular AT that is being financed through a Loan fund program bank loan. The number of new and replacement loans have multiplied by the $180.00 charge.

[11] Main Survey, Alternative Financing Technical Assistance Project, ATAP/RESNA, Library, http://www.resna.org/ATAP/

[12] Alternative Financing Technical Assistance Project, ATAP/RESNA, Library, http://www.resna.org/ATAP/

APPENDIX B

Calculations of the Ratio of Loans to Disabled Population in Small States

State		Number of Loans	Small State Loans to Disabled Population Ratio*
Alaska	58,945	6	.0001017898
Idaho	142,946	36	.0002518434
Maine	169,174	130	.0007684396
Montana	104,646	2	.0000191121
Nevada	305,757	18	.0000588703
New Hampshire	140,647	7	.0000497665
New Mexico	248,410	4	.0000161024
North Dakota	732,010	2	.0000273220
South Dakota	880,300	13	.0001476769
Vermont	214,868	35	.0005129784
Utah	68,229	9	.0000418862
Total		298	

*Ratio = Number of Loans divided by Disabled Population (excludes mental health disability)

APPENDIX C
Calculations of the Obsolescence of AT

Type	Month	
VM		10 years
EI		
Fixed Stair Climber	120	
Bath Adaptation	240	
Powered Modular	36	
Ceiling Mounted Left	180	
Fixed Stair Climber	111	
Automatic Bed	97	
Mobile Hoist	120	
Bathroom Fixed Seat	120	
Total Months	1,024	Ave ÷ 8 = 128 months ÷ 12 months = 10.6 or 11 years
ME		
Shower Chair	118	
Electronic Wheelchair	36	
Adapted existing Wheelchair	66	
Manual and Electronic Wheelchair	105	
Electronic Wheelchair	84	
Electronic Wheelchair	60	
Total	469	÷ 6 =78.1 ÷12 months = 6.5 or 7 years
ATD		
Computer	36	
Telephone	36	
Stereo	115	
PC	60	
Alarm System	87	
Voice Amplifier	49	
Opticon	175	
Braille Output	80	
Long Care	97	
Prosthesis	3	
Condom	119	
Total	797	÷ 11= 72 ÷ 12 months = 6 years

APPENDIX D.
Cost Calculations for $1 Million Capitalization

(A)Year	(B) Initial Fund Cost	(C) Disabled Population% = .007	(D) No. Loan Factor	(E) No of New Loans (dxc)	(F) = EX $180 Consumer Evaluation Costs (ex$180)	(G) VM (% X e .32)	(H) EI (% X e .09)
2004	$1,000,000	101,696	0.000180818	18	$3,240	6	2
2005		102,407	0.000180818	19	$3,333	6	2
2006		103,124	0.000180818	19	$3,356	6	2
2007		103,846	0.000180818	19	$3,380	6	2
2008		104,573	0.000180818	19	$3,404	6	2
2009		105,305	0.000180818	19	$3,427	6	2
2010		106,042	0.000180818	19	$3,451	6	2
2011		106,784	0.000180818	19	$3,476	6	2
2012		107,532	0.000180818	19	$3,500	6	2
2013		108,284	0.000180818	20	$3,524	6	2
2014		109,042	0.000180818	20	$3,549	6	2
2015		109,806	0.000180818	20	$3,574	6	2
2016		110,574	0.000180818	20	$3,599	6	2
2017		111,348	0.000180818	20	$3,624	6	2
2018		112,128	0.000180818	20	$3,649	6	2
2019		112,913	0.000180818	20	$3,675	7	2
2020		113,703	0.000180818	21	$3,701	7	2
2021		114,499	0.000180818	21	$3,727	7	2
2022		115,300	0.000180818	21	$3,753	7	2
2023		116,107	0.000180818	21	$3,779	7	2
				393	$70,721	126	35

(I) ME % X E (e x .23)	(J) % X E (e X .36)	(K) VM Costs (g x 15,000)	(L) EI Costs (h x 6,700)	(M) ME Costs (l x 4,600)	(N) ATD Costs (j x 1,000)	Total New Loans Costs K+l+m+n	(P) Number of VM Replacement Loans
4	6	$86,400	$10,854	$19,044	$6,480	$122,778	
4	7	$88,882	$11,166	$19,591	$6,666	$126,305	
4	7	$89,504	$11,244	$19,728	$6,713	$127,189	
4	7	$90,130	$11,323	$19,866	$6,760	$128,079	
4	7	$90,761	$11,402	$20,005	$6,807	$128,976	
4	7	$91,397	$11,482	$20,145	$6,855	$129,878	
4	7	$92,036	$11,562	$20,286	$6,903	$130,788	
4	7	$92,681	$11,643	$20,428	$6,951	$131,703	
4	7	$93,329	$11,725	$20,571	$7,000	$132,625	
5	7	$93,983	$11,807	$20,715	$7,049	$133,553	
5	7	$94,641	$11,889	$20,860	$7,098	$134,488	6
5	7	$95,303	$11,972	$21,006	$7,148	$135,430	6
5	7	$95,970	$12,056	$21,153	$7,198	$136,378	6
5	7	$96,642	$12,141	$21,302	$7,248	$137,332	6
5	7	$97,319	$12,226	$21,451	$7,299	$138,294	6
5	7	$98,000	$12,311	$21,601	$7,350	$139,262	6
5	7	$98,686	$12,397	$21,752	$7,401	$140,237	6
5	7	$99,377	$12,484	$21,904	$7,453	$141,218	6
5	8	$100,072	$12,572	$22,058	$7,505	$142,207	6
5	8	$100,773	$12,660	$22,212	$7,558	$143,202	6
90	141	$1,886,885	$236,914	$415,681	$141,441	$2,679,922	60

(Q) Number of EI Replacement Loans	(R) Number of ME Replacement Loans	(S) Number of ATD Replacement Loans	(T) Total Number of Replacement Loans	(U) Total Number of All Loans	(V) VM Costs (g x 15,000)	(W) EI Costs (h x 6,700)	(X) ME Costs (l x 4,600)	(Y) ATD Costs (j x 1,000)
			0	18				
			0	19				
			0	19				
			0	19				
			0	19				
			0	19				
	4	6	10	29			$18,400	$6,000
	4	7	11	30			$18,400	$7,000
	4	7	11	30			$18,400	$7,000
	4	7	11	31			$18,400	$7,000
	4	7	17	37	$90,000		$18,400	$7,000
2	8	7	23	43	$90,000	$13,400	$36,800	$7,000
2	8	7	23	43	$90,000	$13,400	$36,800	$7,000
2	8	7	23	43	$90,000	$13,400	$36,800	$7,000
2	8	14	30	50	$90,000	$13,400	$36,800	$14,000
2	9	14	31	51	$90,000	$13,400	$41,400	$14,000
2	9	14	31	52	$90,000	$13,400	$41,400	$14,000
2	9	14	31	52	$90,000	$13,400	$41,400	$14,000
2	9	14	31	52	$90,000	$13,400	$41,400	$14,000
2	9	14	31	52	$90,000	$13,400	$41,400	$14,000
18	97	139	314	707	$900,000	$120,600	$446,200	$139,000

Total Cost of Replacement Loans (v+w+x+y)	Total Cost of all Loans (o+z)	(AA) Total consumer Evaluation Costs for Replacement Loans $180	(AC) total Social Costs (b+f+aa+ab)	1%	2%	3%	4%
	$122,778	0	1,126,018	$1,126,018	$1,126,018	$1,126,018	$1,126,018
	$126,305	0	129,638	$129,638	$129,638	$129,638	$129,638
	$127,189	0	130,545	$129,253	$127,986	$126,746	$125,519
	$128,079	0	131,459	$128,869	$126,358	$123,913	$121,547
	$128,976	0	132,379	$128,487	$124,741	$121,140	$117,685
	$129,878	0	133,306	$128,107	$123,148	$118,442	$113,950
$24,400	$155,188	1,800	160,439	$152,658	$145,310	$138,395	$131,865
$25,400	$157,103	1,980	162,559	$153,130	$144,352	$136,143	$128,470
$25,400	$158,025	1,980	163,505	$152,501	$142,347	$132,946	$124,247
$25,400	$158,953	1,980	164,458	$151,877	$140,365	$129,823	$120,169
$115,400	$249,888	3,060	256,497	$234,516	$214,637	$196,580	$180,215
$147,200	$282,630	4,140	290,344	$262,848	$238,169	$216,045	$196,156
$147,200	$283,578	4,140	291,317	$261,107	$234,306	$210,447	$189,239
$147,200	$284,532	4,140	292,296	$259,384	$230,476	$205,017	$182,568
$154,200	$292,494	5,400	301,543	$264,966	$233,093	$205,351	$181,107
$158,800	$298,062	5,580	307,317	$267,366	$232,915	$203,167	$177,475
$158,800	$299,037	5,580	308,317	$265,554	$229,080	$197,909	$171,209
$158,800	$300,018	5,580	309,325	$263,792	$225,312	$192,771	$165,149
$158,800	$301,007	5,580	310,340	$262,051	$221,644	$187,755	$159,328
$158,800	$302,002	5,580	311,361	$260,298	$218,015	$182,894	$153,688
$1,605,800	$4,285,722	56,520	5,412,962	$4,982,419	4,607,911	4,281,140	3,005,243

5%	6%	1% Discount Factor	2% Discount Factor	3% Discount Factor	4% Discount Factor	5% Discount Factor	6% Discount Factor
$1,126,018	$1,126,018	1.0000	1.000	1.00	1	1.000	1.0000
$123,467	$122,300	$0.9901	0.9804	0.9709	0.9615	0.9524	0.9434
$118,404	$116,185	$0.9803	0.9612	0.9426	0.9246	0.9070	0.8900
$113,554	$110,373	$0.9706	0.9423	0.9151	0.889	0.8638	0.8396
$108,908	$104,858	$0.9610	0.9238	0.8885	0.8548	0.8227	0.7921
$104,445	$99,619	$0.9515	0.9057	0.8626	0.8219	0.7835	0.7473
$119,720	$113,110	$0.9420	0.888	0.8375	0.7903	0.7462	0.7050
$115,530	$108,118	$0.9327	0.8706	0.8131	0.7599	0.7107	0.6651
$110,660	$102,583	$0.9235	0.8535	0.7894	0.7307	0.6768	0.6274
$106,010	$97,343	$0.9143	0.8368	0.7664	0.7026	0.6446	0.5919
$157,464	$143,228	$0.9053	0.8203	0.7441	0.6756	0.6139	0.5584
$169,764	$163,405	$0.8963	0.8043	0.7224	0.6496	0.5847	0.5628
$162,205	$144,784	$0.8874	0.7885	0.7014	0.6246	0.5568	0.4970
$155,005	$137,029	$0.8787	0.773	0.681	0.6006	0.5303	0.4688
$152,309	$133,373	$0.8700	0.7579	0.6611	0.5775	0.5051	0.4423
$147,819	$128,243	$0.8613	0.743	0.6419	0.5553	0.4810	0.4173
$141,240	$121,354	$0.8528	0.7284	0.6232	0.5339	0.4581	0.3936
$134,958	$114,883	$0.8444	0.7142	0.605	0.5134	0.4363	0.3714
$128,946	$108,712	$0.8360	0.7002	0.5874	0.4936	0.4155	0.3503
$123,206	$102,905	$0.8277	0.6864	0.5703	0.4748	0.3957	0.3305
$3,619,634	$3,398,422						

APPENDIX E.
Cost Calculations for $2 Million Capitalization

(A) Year	(B) Initial Fund Cost	(C) Disabled Population % = .007	(D) No. Loan Factor	(E) No of New Loans (dxc)	(F) =EX $180 consumer Evaluation costs (ex$180)	(G) VM (% x e .32)	(H) EI (% x e .09)
2004	$2,000,000	101,696	0.000181	18	$3,240	6	2
2005		102,407	0.000181	19	$3,333	6	2
2006		103,124	0.000181	19	$3,356	6	2
2007		103,846	0.000181	19	$3,380	6	2
2008		104,573	0.000181	19	$3,404	6	2
2009		105,305	0.000181	19	$3,427	6	2
2010		106,042	0.000181	19	$3,451	6	2
2011		106,784	0.000181	19	$3,476	6	2
2012		107,532	0.000181	19	$3,500	6	2
2013		108,284	0.000181	20	$3,524	6	2
2014		109,042	0.000181	20	$3,549	6	2
2015		109,806	0.000181	20	$3,574	6	2
2016		110,574	0.000181	20	$3,599	6	2
2017		111,348	0.000181	20	$3,624	6	2
2018		112,128	0.000181	20	$3,649	6	2
2019		112,913	0.000181	20	$3,675	7	2
2020		113,703	0.000181	21	$3,701	7	2
2021		114,499	0.000181	21	$3,727	7	2
2022		115,300	0.000181	21	$3,753	7	2
2023		116,107	0.000181	21	$3,779	7	2
					$70,721	126	35

(I) ME % X E (e x .23)	(J) % X E (e X .36)	(K) VM Costs (g x 15,000)	(L) EI Costs (h x 6,700)	(M) ME Costs (l x 4,600)	(N) ATD Costs (j x 1,000)	Total New Loans Costs K+l+m+n	(P) Number of VM Replacement Loans
4	6	$86,400	$10,854	$19,044	$6,480	$122,778	
4	7	$88,882	$11,166	$19,591	$6,666	$126,305	
4	7	$89,504	$11,244	$19,728	$6,713	$127,189	
4	7	$90,130	$11,323	$19,866	$6,760	$128,079	
4	7	$90,761	$11,402	$20,005	$6,807	$128,976	
4	7	$91,397	$11,482	$20,145	$6,855	$129,878	
4	7	$92,036	$11,562	$20,286	$6,903	$130,788	
4	7	$92,681	$11,643	$20,428	$6,951	$131,703	
4	7	$93,329	$11,725	$20,571	$7,000	$132,625	
5	7	$93,983	$11,807	$20,715	$7,049	$133,553	
5	7	$94,641	$11,889	$20,860	$7,098	$134,488	6
5	7	$95,303	$11,972	$21,006	$7,148	$135,430	6
5	7	$95,970	$12,056	$21,153	$7,198	$136,378	6
5	7	$96,642	$12,141	$21,302	$7,248	$137,332	6
5	7	$97,319	$12,226	$21,451	$7,299	$138,294	6
5	7	$98,000	$12,311	$21,601	$7,350	$139,262	6
5	7	$98,686	$12,397	$21,752	$7,401	$140,237	6
5	7	$99,377	$12,484	$21,904	$7,453	$141,218	6
5	8	$100,072	$12,572	$22,058	$7,505	$142,207	6
5	8	$100,773	$12,660	$22,212	$7,558	$143,202	6
90	141	$1,885,885	$236,914	$415,681	$141,441	$2,679,922	60

(Q) Number of EI Replacement Loans	(R) Number of ME Replacement Loans	(S) Number of ATD Replacement Loans	(T) Total Number of Replacement Loans	(U) Total Number of All Loans	(V) VM Costs (g x 15,000)	(W) EI Costs (h x 6,700)	(X) ME Costs (l x 4,600)	(Y) ATD Costs (j x 1,000)
			0	18				
			0	19				
			0	19				
			0	19				
			0	19				
			0	19				
	4	6	10	29			$18,400	$6,000
	4	7	11	30			$18,400	$7,000
	4	7	11	30			$18,400	$7,000
	4	7	11	31			$18,400	$7,000
	4	7	17	37	$90,000		$18,400	$7,000
2	8	7	23	43	$90,000	$13,400	$36,800	$7,000
2	8	7	23	43	$90,000	$13,400	$36,800	$7,000
2	8	7	23	43	$90,000	$13,400	$36,800	$7,000
2	8	14	30	50	$90,000	$13,400	$36,800	$14,000
2	9	14	31	51	$90,000	$13,400	$41,400	$14,000
2	9	14	31	52	$90,000	$13,400	$41,400	$14,000
2	9	14	31	52	$90,000	$13,400	$41,400	$14,000
2	9	14	31	52	$90,000	$13,400	$41,400	$14,000
2	9	14	31	52	$90,000	$13,400	$41,400	$14,000
18	97	139	314	707	$900,000	$120,600	$446,200	$139,000

Total Cost of Replacement Loans (v+w+x+y)	Total Cost of all Loans (o+z)	(AA) Total Consumer Evaluation Costs for Replacement Loans $180	(AC) Total Social Costs (b+f+aa+ab)	1%	2%	3%	4%
	$122,778	-	2,126,018	$2,126,018	$2,126,018	$2,126,018	$2,126,018
	$126,305	-	129,638	$129,638	$129,638	$129,638	$129,638
	$127,189	-	130,545	$129,253	$127,986	$126,746	$125,519
	$128,079	-	131,459	$128,869	$126,358	$123,913	$121,547
	$128,976	-	132,379	$128,487	$124,741	$121,140	$117,685
	$129,878	-	133,306	$128,107	$123,148	$118,442	$113,950
$24,400	$155,188	1,800	160,439	$152,658	$145,310	$138,395	$131,865
$25,400	$157,103	1,980	162,559	$153,130	$144,352	$136,143	$128,470
$25,400	$158,025	1,980	163,505	$152,501	$142,347	$132,946	$124,247
$25,400	$158,953	1,980	164,458	$151,877	$140,365	$129,823	$120,169
$115,400	$249,888	3,060	256,497	$234,516	$214,637	$196,580	$180,215
$147,200	$282,630	4,140	290,344	$262,848	$238,169	$216,045	$196,156
$147,200	$283,578	4,140	291,317	$261,107	$234,306	$210,447	$189,239
$147,200	$284,532	4,140	292,296	$259,384	$230,476	$205,017	$182,568
$154,200	$292,494	5,400	301,543	$264,966	$233,093	$205,351	$181,107
$158,800	$298,062	5,580	307,317	$267,366	$232,915	$203,167	$177,475
$158,800	$299,037	5,580	308,317	$265,554	$229,080	$197,909	$171,209
$158,800	$300,018	5,580	309,325	$263,792	$225,312	$192,771	$165,149
$158,800	$301,007	5,580	310,340	$262,051	$221,644	$187,755	$159,328
$158,800	$302,002	5,580	311,361	$260,298	$218,015	$182,894	$153,688
$1,605,800	$4,285,722	56,520	6,412,962	$5,982,419	5,607,911	5,281,140	4,995,243

5%	6%	1% Discount Factor	2% Discount Factor	3% Discount Factor	4% Discount Factor	5% Discount Factor	6% Discount Factor
$2,126,018	$2,126,018	1.0000	1.000	1.00	1	1.000	1.0000
$123,467	$122,300	$0.9901	0.9804	0.9709	0.9615	0.9524	0.9434
$118,404	$116,185	$0.9803	0.9612	0.9426	0.9246	0.9070	0.8900
$113,554	$110,373	$0.9706	0.9423	0.9151	0.889	0.8638	0.8396
$108,908	$104,858	$0.9610	0.9238	0.8885	0.8548	0.8227	0.7921
$104,445	$99,619	$0.9515	0.9057	0.8626	0.8219	0.7835	0.7473
$119,720	$113,110	$0.9420	0.888	0.8375	0.7903	0.7462	0.7050
$115,530	$108,118	$0.9327	0.8706	0.8131	0.7599	0.7107	0.6651
$110,660	$102,583	$0.9235	0.8535	0.7894	0.7307	0.6768	0.6274
$106,010	$97,343	$0.9143	0.8368	0.7664	0.7026	0.6446	0.5919
$157,464	$143,228	$0.9053	0.8203	0.7441	0.6756	0.6139	0.5584
$169,764	$163,405	$0.8963	0.8043	0.7224	0.6496	0.5847	0.5628
$162,205	$144,784	$0.8874	0.7885	0.7014	0.6246	0.5568	0.4970
$155,005	$137,029	$0.8787	0.773	0.681	0.6006	0.5303	0.4688
$152,309	$133,373	$0.8700	0.7579	0.6611	0.5775	0.5051	0.4423
$147,819	$128,243	$0.8613	0.743	0.6419	0.5553	0.4810	0.4173
$141,240	$121,354	$0.8528	0.7284	0.6232	0.5339	0.4581	0.3936
$134,958	$114,883	$0.8444	0.7142	0.605	0.5134	0.4363	0.3714
$128,946	$108,712	$0.8360	0.7002	0.5874	0.4936	0.4155	0.3503
$123,206	$102,905	$0.8277	0.6864	0.5703	0.4748	0.3957	0.3305
$4,619,634	$4,398,422						

APPENDIX F.
Cost Calculations for $ 5 million Capitalization

(A) Year	(B) Initial Fund Cost	(C) Disabled Population % = .007	(D) No. Loan Factor	(E) No of New Loans (dxc)	(F) =EX $180 consumer Evaluation costs (ex$180)	(G) VM (% x e .32)	(H) EI (% x e .09)
2004	$5,000,000	101,696	0.000181	18	$3,240	6	2
2005		102,407	0.000181	19	$3,333	6	2
2006		103,124	0.000181	19	$3,356	6	2
2007		103,846	0.000181	19	$3,380	6	2
2008		104,573	0.000181	19	$3,404	6	2
2009		105,305	0.000181	19	$3,427	6	2
2010		106,042	0.000181	19	$3,451	6	2
2011		106,784	0.000181	19	$3,476	6	2
2012		107,532	0.000181	19	$3,500	6	2
2013		108,284	0.000181	20	$3,524	6	2
2014		109,042	0.000181	20	$3,549	6	2
2015		109,806	0.000181	20	$3,574	6	2
2016		110,574	0.000181	20	$3,599	6	2
2017		111,348	0.000181	20	$3,624	6	2
2018		112,128	0.000181	20	$3,649	6	2
2019		112,913	0.000181	20	$3,675	7	2
2020		113,703	0.000181	21	$3,701	7	2
2021		114,499	0.000181	21	$3,727	7	2
2022		115,300	0.000181	21	$3,753	7	2
2023		116,107	0.000181	21	$3,779	7	2
					$70,721	126	35

(I) ME % x E (e x .23)	(J) % X E (e x .36)	(K) VM Costs (g x 15,000)	(L) EI Costs (h x 6,700)	(M) ME Costs (l x 4,600)	(N) ATD Costs (j x 1,000)	Total New Loans Costs K+l+m+n	(P) Number of VM Replacement Loans
4	6	$86,400	$10,854	$19,044	$6,480	$122,778	
4	7	$88,882	$11,166	$19,591	$6,666	$126,305	
4	7	$89,504	$11,244	$19,728	$6,713	$127,189	
4	7	$90,130	$11,323	$19,866	$6,760	$128,079	
4	7	$90,761	$11,402	$20,005	$6,807	$128,976	
4	7	$91,397	$11,482	$20,145	$6,855	$129,878	
4	7	$92,036	$11,562	$20,286	$6,903	$130,788	
4	7	$92,681	$11,643	$20,428	$6,951	$131,703	
4	7	$93,329	$11,725	$20,571	$7,000	$132,625	
5	7	$93,983	$11,807	$20,715	$7,049	$133,553	
5	7	$94,641	$11,889	$20,860	$7,098	$134,488	6
5	7	$95,303	$11,972	$21,006	$7,148	$135,430	6
5	7	$95,970	$12,056	$21,153	$7,198	$136,378	6
5	7	$96,642	$12,141	$21,302	$7,248	$137,332	6
5	7	$97,319	$12,226	$21,451	$7,299	$138,294	6
5	7	$98,000	$12,311	$21,601	$7,350	$139,262	6
5	7	$98,686	$12,397	$21,752	$7,401	$140,237	6
5	7	$99,377	$12,484	$21,904	$7,453	$141,218	6
5	8	$100,072	$12,572	$22,058	$7,505	$142,207	6
5	8	$100,773	$12,660	$22,212	$7,558	$143,202	6
90	141	$1,885,885	$236,914	$415,681	$141,441	$2,679,922	60

(Q) Number of EI Replacement Loans	(R) Number of ME Replacement Loans	(S) Number of ATD Replacement Loans	(T) Total Number of Replacement Loans	(U) Total Number of All Loans	(V) VM Costs (g x 15,000)	(W) EI Costs (h x 6,700)	(X) ME Costs (l x 4,600)	(Y) ATD Costs (j x 1,000)
			0	18				
			0	19				
			0	19				
			0	19				
			0	19				
			0	19				
	4	6	10	29			$18,400	$6,000
	4	7	11	30			$18,400	$7,000
	4	7	11	30			$18,400	$7,000
	4	7	11	31			$18,400	$7,000
	4	7	17	37	$90,000		$18,400	$7,000
2	8	7	23	43	$90,000	$13,400	$36,800	$7,000
2	8	7	23	43	$90,000	$13,400	$36,800	$7,000
2	8	7	23	43	$90,000	$13,400	$36,800	$7,000
2	8	14	30	50	$90,000	$13,400	$36,800	$14,000
2	9	14	31	51	$90,000	$13,400	$41,400	$14,000
2	9	14	31	52	$90,000	$13,400	$41,400	$14,000
2	9	14	31	52	$90,000	$13,400	$41,400	$14,000
2	9	14	31	52	$90,000	$13,400	$41,400	$14,000
2	9	14	31	52	$90,000	$13,400	$41,400	$14,000
18	97	139	314	707	$900,000	$120,600	$446,200	$139,000

Total Cost of Replacement Loans (v+w+x+y)	Total Cost of all Loans (o+z)	(AA) Total Consumer Evaluation Costs for Replacement Loans $180	(AC) Total Social Costs (b+f+aa+ab)	1%	2%	3%	4%
	$122,778	-	5,126,018	$5,126,018	$5,126,018	$5,126,018	$5,126,018
	$126,305	-	129,638	$129,638	$129,638	$129,638	$129,638
	$127,189	-	130,545	$129,253	$127,986	$126,746	$125,519
	$128,079	-	131,459	$128,869	$126,358	$123,913	$121,547
	$128,976	-	132,379	$128,487	$124,741	$121,140	$117,685
	$129,878	-	133,306	$128,107	$123,148	$118,442	$113,950
$24,400	$155,188	1,800	160,439	$152,658	$145,310	$138,395	$131,865
$25,400	$157,103	1,980	162,559	$153,130	$144,352	$136,143	$128,470
$25,400	$158,025	1,980	163,505	$152,501	$142,347	$132,946	$124,247
$25,400	$158,953	1,980	164,458	$151,877	$140,365	$129,823	$120,169
$115,400	$249,888	3,060	256,497	$234,516	$214,637	$196,580	$180,215
$147,200	$282,630	4,140	290,344	$262,848	$238,169	$216,045	$196,156
$147,200	$283,578	4,140	291,317	$261,107	$234,306	$210,447	$189,239
$147,200	$284,532	4,140	292,296	$259,384	$230,476	$205,017	$182,568
$154,200	$292,494	5,400	301,543	$264,966	$233,093	$205,351	$181,107
$158,800	$298,062	5,580	307,317	$267,366	$232,915	$203,167	$177,475
$158,800	$299,037	5,580	308,317	$265,554	$229,080	$197,909	$171,209
$158,800	$300,018	5,580	309,325	$263,792	$225,312	$192,771	$165,149
$158,800	$301,007	5,580	310,340	$262,051	$221,644	$187,755	$159,328
$158,800	$302,002	5,580	311,361	$260,298	$218,015	$182,894	$153,688
$1,605,800	$4,285,722	56,520	9,412,962	$8,982,419	8,607,911	8,281,140	7,995,243

5%	6%	1% Discount Factor	2% Discount Factor	3% Discount Factor	4% Discount Factor	5% Discount Factor	6% Discount Factor
$5,126,018	$5,126,018	1.0000	1.000	1.00	1	1.000	1.0000
$123,467	$122,300	$0.9901	0.9804	0.9709	0.9615	0.9524	0.9434
$118,404	$116,185	$0.9803	0.9612	0.9426	0.9246	0.9070	0.8900
$113,554	$110,373	$0.9706	0.9423	0.9151	0.889	0.8638	0.8396
$108,908	$104,858	$0.9610	0.9238	0.8885	0.8548	0.8227	0.7921
$104,445	$99,619	$0.9515	0.9057	0.8626	0.8219	0.7835	0.7473
$119,720	$113,110	$0.9420	0.888	0.8375	0.7903	0.7462	0.7050
$115,530	$108,118	$0.9327	0.8706	0.8131	0.7599	0.7107	0.6651
$110,660	$102,583	$0.9235	0.8535	0.7894	0.7307	0.6768	0.6274
$106,010	$97,343	$0.9143	0.8368	0.7664	0.7026	0.6446	0.5919
$157,464	$143,228	$0.9053	0.8203	0.7441	0.6756	0.6139	0.5584
$169,764	$163,405	$0.8963	0.8043	0.7224	0.6496	0.5847	0.5628
$162,205	$144,784	$0.8874	0.7885	0.7014	0.6246	0.5568	0.4970
$155,005	$137,029	$0.8787	0.773	0.681	0.6006	0.5303	0.4688
$152,309	$133,373	$0.8700	0.7579	0.6611	0.5775	0.5051	0.4423
$147,819	$128,243	$0.8613	0.743	0.6419	0.5553	0.4810	0.4173
$141,240	$121,354	$0.8528	0.7284	0.6232	0.5339	0.4581	0.3936
$134,958	$114,883	$0.8444	0.7142	0.605	0.5134	0.4363	0.3714
$128,946	$108,712	$0.8360	0.7002	0.5874	0.4936	0.4155	0.3503
$123,206	$102,905	$0.8277	0.6864	0.5703	0.4748	0.3957	0.3305
$7,619,634	$7,398,422						

Total Cost of Replacement Loans (v+w+x+y)	Total Cost of all Loans (o+z)	(AA) Total Consumer Evaluation Costs for Replacement Loans $180	(AC) Total Social Costs (b+f+aa+ab)	1%	2%	3%	4%
	$122,778	-	2,126,018	$2,126,018	$2,126,018	$2,126,018	$2,126,018
	$126,305	-	129,638	$129,638	$129,638	$129,638	$129,638
	$127,189	-	130,545	$129,253	$127,986	$126,746	$125,519
	$128,079	-	131,459	$128,869	$126,358	$123,913	$121,547
	$128,976	-	132,379	$128,487	$124,741	$121,140	$117,685
	$129,878	-	133,306	$128,107	$123,148	$118,442	$113,950
$24,400	$155,188	1,800	160,439	$152,658	$145,310	$138,395	$131,865
$25,400	$157,103	1,980	162,559	$153,130	$144,352	$136,143	$128,470
$25,400	$158,025	1,980	163,505	$152,501	$142,347	$132,946	$124,247
$25,400	$158,953	1,980	164,458	$151,877	$140,365	$129,823	$120,169
$115,400	$249,888	3,060	256,497	$234,516	$214,637	$196,580	$180,215
$147,200	$282,630	4,140	290,344	$262,848	$238,169	$216,045	$196,156
$147,200	$283,578	4,140	291,317	$261,107	$234,306	$210,447	$189,239
$147,200	$284,532	4,140	292,296	$259,384	$230,476	$205,017	$182,568
$154,200	$292,494	5,400	301,543	$264,966	$233,093	$205,351	$181,107
$158,800	$298,062	5,580	307,317	$267,366	$232,915	$203,167	$177,475
$158,800	$299,037	5,580	308,317	$265,554	$229,080	$197,909	$171,209
$158,800	$300,018	5,580	309,325	$263,792	$225,312	$192,771	$165,149
$158,800	$301,007	5,580	310,340	$262,051	$221,644	$187,755	$159,328
$158,800	$302,002	5,580	311,361	$260,298	$218,015	$182,894	$153,688
$1,605,800	$4,285,722	56,520	6,412,962	$5,982,419	5,607,911	5,281,140	4,995,243

APPENDIX G
Steps in Benefits Calculations

I. EMPLOYMENT OF DISABLED

A. Estimate the number of loan recipients who would be employed after receiving loan.

1. Determine the employment status of loan recipients. This was obtained from the ATAP survey of loan recipients.[13] The survey shows that 14% worked full-time, 12% worked part-time, and 70% did not work (and 4% did not answer).
2. Determine from the unemployed disabled loan recipients the number of loan recipients who would be employed as a result of receiving a loan. Several sources were used. The ATAP "Follow-up Survey" indicated that 47% of those unemployed loan recipients would seek work.[14] Another study indicated the 79% of non working people (16 to 64 years) with a disability indicated that they want to work.[15]
3. Multiply non- working of .70 by number of new loans.
4. The product of 3 is then multiplied by .47 to get the number who would go to work.
5. The product of 3 is then multiplied by .79 to get the number who would go to work.
6. Determine the proportion of part time or full time employment that would be pursued by for the number of disabled who would go to work. Data on full-time and part-time jobs by disabled is reported by the through the U.S. Census.[16]
7. Determine how many of the disabled who would want to work are likely to get jobs. This done by adjusting the potential full-time workers by the

[13] Main Survey, Alternative Financing Technical Assistance Project, ATAP/RESNA, Library, http://www.resna.org/ATAP/

[14] Follow-up Survey, Alternative Financing Technical Assistance Project, ATAP/RESNA, Library, http://www.resna.org/ATAP/

[15] National Organization on Disability, (1994a). Closing the gap: America's challenge, The N.O.D./Harris survey of Americans with disabilities—A summary. New York: National Organization on Disability; National Organization on Disability, (1994b). N.O.D./Harris survey of Americans with disabilities—A summary. New York NY: Louis Harris and Associates. Both are cited in Chartbook on Work and Disability in the United States, 1998, prepared by Susan Stoddard, Lita Jans, Joan M. Ripple, and Lewis Kraus, U. S. Department of Education, National Institute on Disability and Rehabilitation Research, Washington, D.C.

[16] U. S. Census Bureau, Disability, Labor Force Status -- Civilians 16 to 74 Years Old, by Educational Attainment and Sex:: 2002 http://www.census.gov/hhes/www/disable/cps/cps202.html.

unemployment rate of disabled workers.[1217] The unemployment rate indicates the proportion of disabled individuals that are classified as being in the workforce since they are seeking work, but they are unable to find a job. It is assumed that the loan recipients who are unemployed but would seek full-time work would be confronted with the same limitations as those disabled individuals already in the work force. Thus full-time seekers of work are adjusted downward by the unemployment rate.

8. Determine the average age of the disabled who are likely to go to work. This obtained from the ATAP Main Survey which indicates that the average age of a loan recipient is approximately 45 years old.[18]
9. The worklife expectancy of those likely to go to work is assumed to 60 years of age. Thus the amount of work years is 15 (60 - 45 years old).
10. Determine the amount of earnings. Two steps were undertaken. First, while the borrowers who are expected to go to work are predicted to be 45 years old on average, if go to work they are not likely start at pay level that is currently received by 45 year old disabled who already in the workforce. Rather they would receive pay equivalent to disabled individuals who have no work experience and this is likely to be initial starting pay for those disabled individuals initially entering the work force. Thus two figures of the mean earnings of disabled workers at age 16 to 24 years of age were chosen: $21,053 for full-time workers in 2000 and $6,453 for part-time workers in 2000.[19] Second, there is the issue of productivity of wage growth over the worklife expectancy of the newly employed disabled workers. It is assumed very conservatively that it would be 2% per annum. Also, the initial starting pay in 2004 was adjusted by a 2% increase each year from 2000 to 2004.

[17] U. S. Census Bureau, Disability, Labor Force Status -- Civilians 16 to 74 Years Old, by Educational Attainment and Sex:: 2002 http://www.census.gov/hhes/www/disable/cps/cps202.html
[18] Main Survey, Alternative Financing Technical Assistance Project, ATAP/RESNA, Library, http://www.resna.org/ATAP/
[19] U. S. Census Bureau, Disability, Work Experience and Mean Earnings in 2000—Work Disability Status of Civilians 16-74 Years Old, by Educational Attainment and Sex:: 2002 http://www.census.gov/hhes/www/disable/cps/cps302.html

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