# Investing in Denver's Workforce & Economic Future: Benefits of the Denver Scholarship Foundation

**Prepared For**

Denver Scholarship FOUNDATION

**Prepared By**

THE PELL INSTITUTE
for the Study of Opportunity in Higher Education

Development Research Partners

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*Forward for* ***Investing in Denver's Workforce & Economic Future: Benefits of the Denver Scholarship Foundation***

The Denver Scholarship Foundation is making a difference. We are transforming lives and expanding horizons.

And now we have the evidence to prove it.

As we've worked with scholars to pay for college and stay in college, we've seen that the Denver Scholarship Foundation is having a positive impact. Anecdotes are important, but we wanted more. We wanted to better understand the workforce, economic and social impacts that are the direct result of attaining a postsecondary degree or certificate. We wanted to understand the impact on our scholars and also on the Denver community as a whole.

This report, conducted by the Pell Institute for the Study of Opportunity in Higher Education and Development Research Partners, offers the evidence we needed.

***Investing in Denver's Workforce & Economic Future: Benefits of the Denver Scholarship Foundation*** shines a bright light on the societal and economic benefits that are the direct result of increasing rates of college entrance and completion for our scholars and their families.

As we near the 10-year mark of our work, we are proud of our progress, including:

- Awarding 4,500 DPS graduates with $25 million in scholarships, an amount doubled by our college partners, who have stepped up to invest an additional $50 million in our scholars;
- Seventy-six percent of our scholars have completed a postsecondary credential or continue to work toward that important milestone;
- Eight hundred of our scholars have graduated from college.

Our needs-based award is helping combat long-standing racial and economic disparities in college access and success. Our work is focused on DPS graduates—68 percent are Latino and African American and 70 percent qualify for free and reduced lunch. Further, 74 percent of our scholars will be first-generation college graduates.

As this study demonstrates, while Colorado ranks in the top five for the number of degree holders per capita, only one in four of our state's high school freshman will go on to earn a postsecondary degree. Contrast that worrisome statistic with the demand for a college-educated workforce (by 2020, 74 percent of all jobs in Colorado will require some level of college education or training) and it's easy to see we have a long way to go.

This study confirms the benefits of postsecondary success. A higher level of educational attainment means a lower unemployment rate and higher earnings potential. For the Denver Metro region, the study finds that the average Denver Scholarship Foundation investment in a graduate returns $9.59 for every $1.00 in scholarship, in federal, state and local taxes paid.

In 2014, we were humbled when DPS Superintendent, Tom Boasberg, called out the Denver Scholarship Foundation for contributing to DPS's strides in student achievement. This study establishes the importance of our role in strengthening the workforce and adding to the economic success of the region.

From helping to meet the demand for skilled workers in Denver's fastest growing fields to combatting male arrest and incarceration rates with higher educational attainment, there is a substantiated need for what the Denver Scholarship Foundation provides.

The need is clear. Now, we also know what works.

With such a high return on investment, we will continue our work with urgency. Nearly a decade ago, we had high hopes for the impact and potential of the Denver Scholarship Foundation.

Today, it is rewarding to understand the positive impact and imagine a future when our investment in human capital pays even greater dividends within and beyond our community.

Cathey Finlon
Board Chair
Denver Scholarship Foundation

Nate Easley, Ph.D.
Executive Director
Denver Scholarship Foundation

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# Executive Summary

There is strong evidence that the Denver Scholarship Foundation's (DSF) services and scholarships are improving the educational outcomes for participants. This study seeks to document the return on investment of DSF's scholarships for low-income Denver Public School (DPS) graduates and to estimate the economic benefits that DSF scholarship recipients—who subsequently complete a postsecondary education—bring to the Denver metropolitan region. The goal of this report is to share the benefits of DSF with stakeholders, potential funding collaborators, community leaders, and the general public who may not be aware of DSF, its contributions, or its impact.

As many communities turn their focus to college and career readiness for measuring the success of secondary education, DSF presents a model for collective impact that can be replicated in districts across the nation. DSF's activities represent a significant, innovative investment in the educational and economic future of the City and County of Denver. This analysis extends the understanding of how increasing rates of college entrance and completion benefit the lives of the participants and their families, as well as their effects on the economic and social well-being of the Denver region and Colorado. A number of higher education publications, such as *Education Pays* by the College Board, point to the positive correlation between higher education attainment and such outcomes as earnings, social mobility, health factors, and civic engagement. This study focuses on the benefits the Denver metropolitan area derives from these outcomes.

Since the inception of DSF in 2006, many important and encouraging changes have taken place in the Denver Public Schools. Graduation rates in the district have risen continuously over the past seven years. The district's four-year on-time graduation rate improved overall by 2.5 percentage points between 2012 and 2013, to 61.3 percent, amassing a 22 percentage point improvement since 2006-07. Additionally—and perhaps most notably—the number of students pursuing college immediately after graduation has increased by nearly 30 percent. Another important, lesser-reported metric by which DSF can gauge the success of its efforts is the increase in postsecondary retention and graduation rates district wide. Since 2006, DPS has experienced an increase of 14.5 percentage points in the number of DPS graduates either retained in college or completing a postsecondary credential.

## Cost-Benefit Analysis of DSF Scholarship Investment

DSF's investments in student aid have a return that can be quantified, using widely held metrics for increased earnings for associate and bachelor's degree holders over their peers with only a high school diploma. Nationally, bachelor's degree holders in the workforce pay $5,000 more in taxes and earn $16,100 more per year, on average, than those with only a high school diploma. Associate degree holders pay $2,200 more in taxes and earn $7,200 more per year. Using these estimates, the average DSF investment in a DSF graduate returns $9.59 for every $1.00 in scholarship, in taxes paid *(including federal income, Social Security, Medicare, state and local income, sales, and property taxes).*

In addition to the increased tax revenues federal, state, and local governments enjoy from college graduates, these individuals also require less public spending on income support programs, providing a direct financial return on investment in postsecondary education. In 2011, 12 percent of high school graduates ages 25 and older lived in households that relied on SNAP (Supplemental Nutritional Assistance Program) benefits, compared to just 2 percent of those with at least a bachelor's degree. Similarly, nearly a quarter of high school graduates received Medicaid benefits, while fewer than 10 percent of those with at least a bachelor's degree required the same.

The benefits of DSF investment also correlates to improvements in quality of life such as decreased crime and incarceration rates. An Alliance for Excellent Education study estimates that a 5 percentage point

increase in the national high school graduation rate for male students alone would save the nation an incredible $19.7 billion annually. That same study estimates that a 5 percentage point increase in the graduation rate for males in Colorado would save $217 million annually and those savings would be increased for every one of those men who went on to college. Encouragingly, the DPS male graduation rate rose from 33 percent in 2007 to 57 percent in 2014.

The National Institute of Corrections reports the annual cost for an inmate to Colorado taxpayers is $30,374. That **annual** cost for incarceration is 2.3 times higher than the **total** average award for a DSF scholarship recipient. If the Denver community could make a comparable investment in postsecondary opportunity as it does on incarceration, the result would be decreased criminal activity as well as significantly increased life chances for the region's youth.

## Educational Outcomes of DSF Graduates

DSF has awarded scholarships to DPS students since the fall of 2007. By spring 2008, the first three DSF graduates achieved certificates through the program. Overall, through spring 2014, 750 DSF recipients have completed a postsecondary degree program or certificate. Sixty-six percent of DSF graduates have completed a bachelor's or higher-level degree, a key measure of educational attainment in state and federal statistics. Nearly 100 students completed degrees in science, technology, engineering, and mathematics (STEM) oriented fields. In addition, 85 students graduated with an education in health services. Eleven DSF graduates have gone on to complete master's degrees and one has completed a doctoral degree.

DSF anticipates that it will award scholarships to an estimated 520 new students each year, based on the number of new scholarships granted over the last three years. DSF's objective is to have 85 percent of their scholarship recipients earn a certificate or higher-level degree. If DSF achieves this goal, the program will help 442 students earn certificates or degrees each year. The returns to education and economic outcomes of college graduates are well documented. DSF graduates will have improved occupational and wage outcomes, as well as boost the economy of the Denver region.

## Occupational Outcomes of DSF Graduates

DSF graduates will have higher occupational concentrations in fields that require higher education such as management, business and financial operation specialists, architecture and engineering, physical and social sciences, and education. These occupations require more education and generally pay more. Management, business and financial operation specialists, computer and mathematical, architecture and engineering, physical and social sciences, and education are among the highest paying occupational groups based on median wages in the Denver Metropolitan Statistical Area (MSA).

Occupational groups in the Denver region are classified according to a continuum of supply and demand, in order: in demand (supply<demand), stable, competitive, and saturated (supply>demand). A comparison of anticipated occupational outcomes for DSF graduates with the outlook for each occupational group in the Denver MSA indicates that most DSF graduates will enter a stable or competitive job market. This includes the largest occupational groups for DSF graduates including management, sales, and office and administrative support.

A large portion of DSF graduates are expected to fill positions in education and related occupations. DSF graduates will likely enter education, training, and library occupations in higher concentrations than overall rates in the Denver MSA and Colorado, thereby meeting part of the demand for workers in one of the fastest growing and in-demand occupational fields. Education, training, and library occupations are expected to have a high level of absolute growth, increasing by more than 9,740 jobs by 2019.

# Executive Summary

DSF graduates entering healthcare practitioner and technical occupations will likely exceed the percentage in the Denver MSA and help to meet demand for skilled workers in the region. Healthcare practitioners and technical occupations is the second-fastest growing field in the Denver MSA and includes doctors, nurses, dentists, chiropractors, pharmacists, therapists, and veterinarians. From 2014 to 2019, 10,940 more jobs are expected in this field. Several occupations in this group are among the most in-demand occupations in the Denver MSA, including podiatrists, exercise physiologists, anesthesiologists, and speech and language pathologists.

## Economic Impact

The earnings potential of DSF recipients is higher than those with only a high school diploma. DSF recipients achieve greater earnings through a more favorable occupational mix, higher salaries, and lower unemployment rates based on the level of educational attainment. The students that graduate with a certificate or degree each year because of a DSF scholarship will have better earnings outcomes, lower unemployment rates, and better career opportunities than if they had merely graduated from high school.

The exact location of DSF graduates after graduation is unknown, but data suggests that the majority live and work in the Denver region. According to the last known zip codes of DSF recipients, about 97 percent were located in the Denver region, meaning scholarship recipients have a strong propensity to attend institutions close to home. While DSF has anecdotal evidence that many of its graduates return to the Denver region to live and work after they complete school, the economic benefits for three scenarios are reported in this study to account for this ambiguity. The lower bound is based on the assumption that 80 percent of graduates live and work in the Denver region. The impacts based on 90 percent residency and 100 percent residency are also reported.

If DSF achieves its goal of 520 new recipients each year, with an 85 percent persistence rate, the program will help 442 students earn certificates or degrees each year. The 520 DSF recipients mean greater economic benefits to the Denver region. If 100 percent of the recipients return to or remain in Denver, the benefits include:

- Of the 520 DSF recipients, only 26 are likely to be unemployed, which is 13 less than if the DSF recipients had only achieved a high school diploma.
- Due to lower unemployment and higher paying career opportunities, the DSF recipients will have $8 million more in annual earnings (compared with a high school diploma).
- Of the $8 million in higher annual earnings, about $6.5 million more will be spent in the Denver region (after savings and leakage).
- The $6.5 million in additional annual spending in the Denver region ripples throughout the economy, resulting in an $8.1 million annual increase in the value of total output in the Denver region when multiplier effects are considered.
- An additional 66 direct and indirect workers will need to be employed throughout the Denver region in order to accommodate the $8.1 million increase in output.
- The 66 additional workers will earn about $2.4 million annually in salary and wages.
- Spending by the 520 DSF recipients will generate $64,300 in additional annual retail sales tax revenue for the City and County of Denver.

The 80 and 90 percent scenarios result in slightly lower benefits, as detailed in Table 13.

# Executive Summary

**Table 13: Summary of Annual Economic Benefits of DSF Recipients**

| | 100% | 90% | 80% |
|---|---|---|---|
| DSF Recipient Additional Earnings | $8,031,800 | $7,228,700 | $6,656,900 |
| DSF Recipient Annual Spending | $6,505,000 | $5,854,000 | $5,204,000 |
| **Multiplier Impacts (Metro Denver)** | | | |
| Value of Total Output | $8,115,000 | $7,303,000 | $6,491,000 |
| Direct & Indirect Earnings | $2,396,000 | $2,156,000 | $1,917,000 |
| Direct & Indirect Employment | 66 | 60 | 53 |
| **Fiscal Impact (City and County of Denver)** | | | |
| Sales Tax Revenue | $64,340 | $57,910 | $53,330 |

In light of these clear benefits, it is important to place in context recent changes to DSF scholarship offerings. Fiscal constraints at DSF have led to a reduction in the number of students who can receive DSF's crucial college access services and financial support for college attendance. Now, more than ever, it is important for continued investment in organizations like DSF whose support has such a strong impact on the most vulnerable high school graduates.

# Chapter 1: Background Information

## Introduction

Founded in 2006, the Denver Scholarship Foundation (DSF) enables Denver Public School (DPS) students to achieve their postsecondary goals by providing the skills, knowledge, and financial resources essential for college success. DSF accomplishes this through a three-part program: (1) Future Centers that provide advising and other college access services in all of the large DPS high schools as well as outreach to all DPS seniors; (2) the award of need-based scholarships to DPS graduates attending college or technical school in Colorado; and (3) direct partnership with Colorado colleges to provide scholarship recipients with extra financial aid and ongoing support throughout their college career. DSF envisions that more postsecondary graduates will enhance Denver's home-grown workforce productivity and ultimately lead to greater economic growth in the region.[1]

While momentum has increased in Colorado for improving postsecondary educational access and success, the state faces persistent challenges in meeting those objectives. In 2011, Colorado ranked 49th among the states in state and local public support per full-time student in public colleges. At the same time, in average tuition and fees for full-time students, Colorado is the 11th most expensive state in the country (NCHEMS, 2011). This gap between Colorado's public investment in higher education and the cost to students is staggering. No figures illustrate the outcome of this stark reality better than those called the "Colorado Paradox." The state ranks in the top five for the number of degree holders per capita, but only one in four current Colorado ninth graders will go on to earn a degree. For DPS students, the numbers are even bleaker. In Denver, for every 100 ninth graders, 60 graduate high school four years later, 46 immediately enter college, 19 are still enrolled in their second year, and only eight get an associate or bachelor's degree in six years. DSF's efforts combat the Colorado Paradox and place an intense focus on growing the number of Denver residents who can contribute to the educational and economic future of the City and County of Denver.

There is strong evidence that DSF services and scholarships are improving the educational outcomes for participants. This project extends the understanding of how increasing rates of college entrance and completion benefit the lives of the participants and their families, as well as their effects on the economic and social well-being of the Denver region and Colorado.

State- and community-supported scholarship programs such as DSF serve a key role in the access and success of students in higher education across the nation. Yet, little research has examined the specific impact of need-based aid on valued student outcomes (Castleman & Long, 2012). Researchers have consistently found positive effects on college enrollment for aid programs like DSF that have transparent eligibility criteria and straightforward application processes (Deming & Dynarski, 2009). New research suggests that need-based aid has a positive effect on persistence and degree completion and is thus a positive social investment (Castleman & Long, 2012).

The social and private benefits of programs such as DSF far outweigh the costs of the scholarships. Consider, for example, the benefits of an increase in educational attainment. The differential in terms of annual earnings and taxes paid between median full-time workers with a bachelor's degree and those with only a high school diploma was $16,100 and $5,000 respectively in 2011 (Baum, Ma & Payea, 2013). By intentionally focusing on need-based awards to low-income Denver students, DSF addresses not only the access and success of the largest-growing population of potential students but the economic future of the Denver region and the state of Colorado.

[1] The Denver-Aurora-Broomfield Metropolitan Statistical Area consists of 10 counties: Adams, Arapahoe, Broomfield, Clear Creek, Denver, Douglas, Elbert, Gilpin, Jefferson, and Park Counties. This area is referred to as the Denver MSA or simply the Denver region throughout this report.

# Chapter 1: Background Information

While the DSF approach is meeting with success, there has been little policymaker or public awareness of these advances. Furthermore, there is a critical need to place that "success," the numbers on college participation, persistence, and completion, into a broader framework. What does a 30 percent increase in college participation signify for college completion? For jobs and wages? For the local economy? What can be expected in the way of economic growth and what savings might be expected in the form of less need for economic and social welfare support? In short, what overall benefits are likely from the DSF investment in financial aid and academic support?

This project has two chief aims. One is to conduct a cost-benefit analysis to inform:

- Stakeholders who are aware or currently work with DSF;
- Potential funders and community leaders who may be persuaded to make a greater investment in DSF, and
- The general public who may not know about DSF, its contributions, or its impact.

The second is to estimate the economic benefits of DSF scholarships. The analysis begins with estimates of occupational outcomes for DSF graduates, earnings potential, and spending benefits. While DSF has limited data on the employment and occupational outcomes of its graduates, the intent of the study is forward-looking. The report analyzes the impact DSF would have under a projected level of ongoing enrollment and under the assumption that 85 percent of the DSF scholarship recipients complete their postsecondary program. The combined analyses more fully examine the social and economic impacts on the Denver region and the state of Colorado.

Because the audience of this study includes both policymakers and the general public, who have various levels of awareness, understanding, and dispositions to DSF, outcomes and their potential benefits will be described at the community level rather than for the individual. For example, the study demonstrates how a greater share of college participants and graduates in the community is likely to decrease reliance on (and costs associated with) the social safety net. The ultimate intent of this study is to make the case that DSF programs are good for the economy and business community in the Denver region and Colorado. The study will clearly illustrate that DSF programs have significant, quantifiable benefits for the students it supports and communities in which they live and work.

Throughout the report, a *DSF recipient* is an individual that received scholarship dollars from DSF, regardless of whether they completed a certificate or degree program. A *DSF graduate* is a DSF recipient that did complete a certificate or degree program.

## Methodology

### *Cost-Benefit Analysis*

This study is guided by the overarching question: What is the value and return on investment (ROI) of the DSF scholarship for DSF and more importantly for the Denver region?

1. What is the value of and return on investment of DSF scholarships? A forecast of present and potential ROI is calculated with the assumption of a representative scholarship award calculated by using previous years' payments.

2.What value do DSF recipients' college completions (technical certificates, associate or bachelor's degrees) add to the Denver region or the broader Colorado community in terms of "value added" and burden lifted (increased income tax revenue, decreased costs for public assistance programs, number in workforce, and impact on the economy)? The outcome measure of the DSF program is the projected number of additional students who will earn technical certificates and degrees after the program implementation.

# Chapter 1: Background Information

For the purpose of this study, the Pell Institute utilized cost benefit analysis to make an economic assessment of DSF scholarship awards, taking into account the cost of the scholarship and forgone tax payments during the time a scholar is pursuing a degree. Cost-benefit analysis is the "evaluation of alternatives according to their costs and benefits, when each is measured in monetary terms" (Levin & McEwan, 2002). Cost-benefit analysis is a decision-oriented method of inquiry. The decision maker's first task is to determine which educational outcome is to be pursued. Cost-benefit analysis is a useful methodology for DSF's needs because it is a straightforward approach to clearly articulate the value of their scholarship investments and convince their constituency that those investments translate into great public value. Cost-benefit analysis typically builds on rigorous program evaluation, which was the case for this study. The DSF evaluation team provided the Pell Institute and Development Research Partners full access to their scholarship payment records and other pertinent documentation collected since the inception of their program. The research team also utilized the annual reports from DSF, Colorado Department of Higher Education reports, Denver Public School reports, Census Bureau data, and other higher education literature to augment and contextualize the findings.

Cost-benefit analyses can measure a wide range of outcomes. Cost-benefit analysis usually accounts for public benefits to society but may also consider benefits to individuals and families. The primary outcomes in this study are: earning a postsecondary credential (associate and bachelor's degrees are the primary frames of reference for this report); difference in earnings and tax payments by education level; and difference in use of public assistance programs. In the case of DSF, the outcome of interest is increasing the rate of college entrance and subsequent completion. The three most common approaches to cost-benefit analysis provide differing conditions for establishing estimates. The first provides estimates based upon well-documented impacts, the second provides estimates based upon well-documented impacts and future estimates that build upon these documented impacts, and the third provides estimates based on undocumented assumptions that the program achieves its aims and hypothetical projections not based in hard data. The Pell Institute provides estimates for the DSF scholarship in well-documented benefits of a college degree combined with estimates of future earnings and tax payments. This is a best practice in higher education research that seeks to elucidate the "payoff" for a college degree and helps the public to better place the value of the scholarship investment in real impact of a community's future. The cost-benefit methodology can be synthesized as follows:

The analysis takes into account:

- Costs of program participation – for individuals, organizations, and taxpayers
- Costs and monetary benefits – for individuals and for society – of various outcomes
- Percentage of individuals in program group and comparison group who experience those outcomes (or are projected to experience those outcomes)

**Result**: Average impact of the program across individuals

### *Economic Impact Analysis*

The second analytic portion of this study focuses on the occupational outcomes and earnings potential of DSF graduates. The economic returns to higher education for individuals in the U.S. are well documented. Not only do earnings increase as educational attainment increases, but educated individuals have lower unemployment rates and better occupational outcomes than those with only high school degrees or less education.

In order to estimate the economic benefits of DSF scholarships, the analysis begins with estimates of occupational outcomes for DSF graduates, earnings potential, and spending benefits. However, DSF has limited data on the employment and occupational outcomes of its graduates. Further, the intent of the study is forward-looking; analyzing the impact DSF would have under a projected level of ongoing

enrollment and under the assumption that 85 percent of DSF recipients complete their postsecondary program.[2] Therefore, this study does not determine the impacts the scholarships have had, nor does it survey participants to determine actual outcomes. Rather, the study incorporates national and regional level data and statistics on occupational mix, educational attainment, and employment to estimate outcomes for a projected number of scholarship recipients.

In addition, the current location of DSF graduates is unknown. According to the last known zip codes of DSF recipients, about 97 percent were located in the Denver region. However, the data includes DSF recipients who are currently receiving scholarship assistance, meaning scholarship recipients have a strong propensity to attend institutions close to home. The rate is likely much lower for other students from the Denver region. At a state level, only 75 percent of students attend an in-state institution (National Center for Education Statistics, 2013). DSF has anecdotal evidence that the majority of its graduates return to the Denver region to live and work after they complete school. In addition, the high percentage of DSF recipients who are African American and Hispanic may contribute to many recipients choosing to remain in the Denver region post-graduation (Compton and Pollak, 2009).[3] The economic benefits for three scenarios are reported in this study, one based on the assumption that 80 percent of graduates live and work in the Denver region, one based on 90 percent residency, and the final based on 100 percent residency.

The economic benefits in this study are reported in current dollars. Inflation is not factored into the analysis. Appendix B describes additional analysis assumptions. The combined analyses fully examine the social and economic impacts of the Denver Scholarship Foundation on the Denver region.

[2] According to DSF, the current rate of persistence for scholarship recipients is about 76 percent. Appendix A presents estimates of the economic benefits assuming a 76 percent persistence rate.
[3] Nearly 68 percent of DSF recipients are African American or Hispanic.

# Chapter 2: Cost-Benefit Analysis

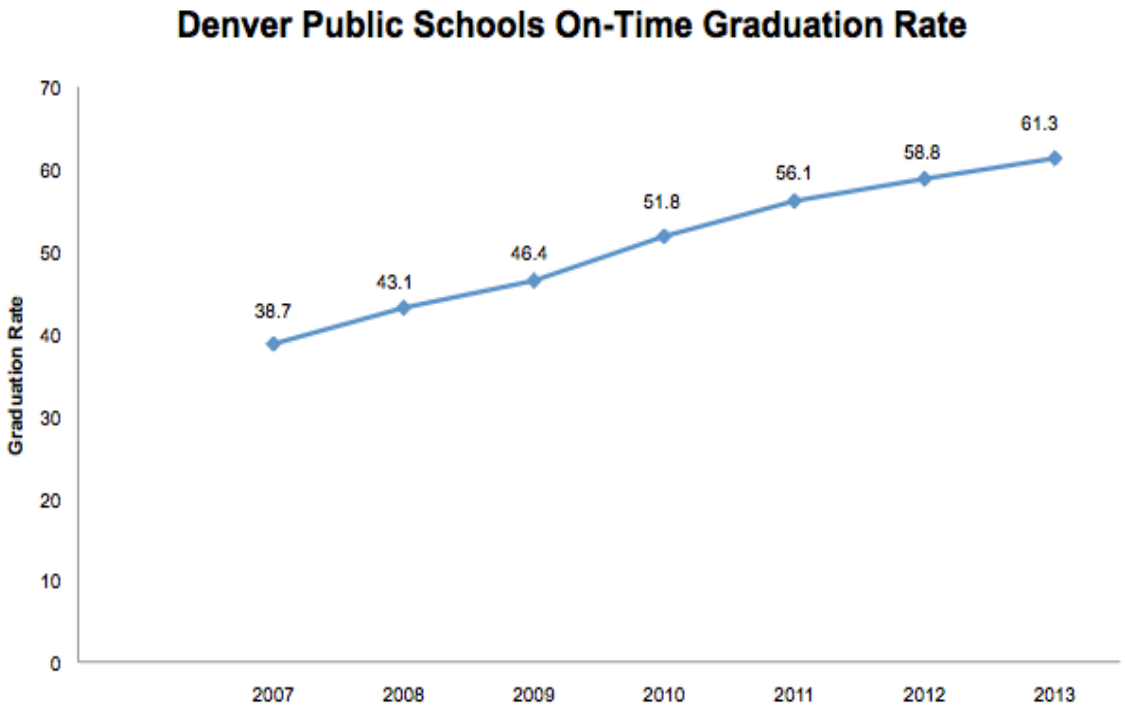
## Description of DSF Outcomes

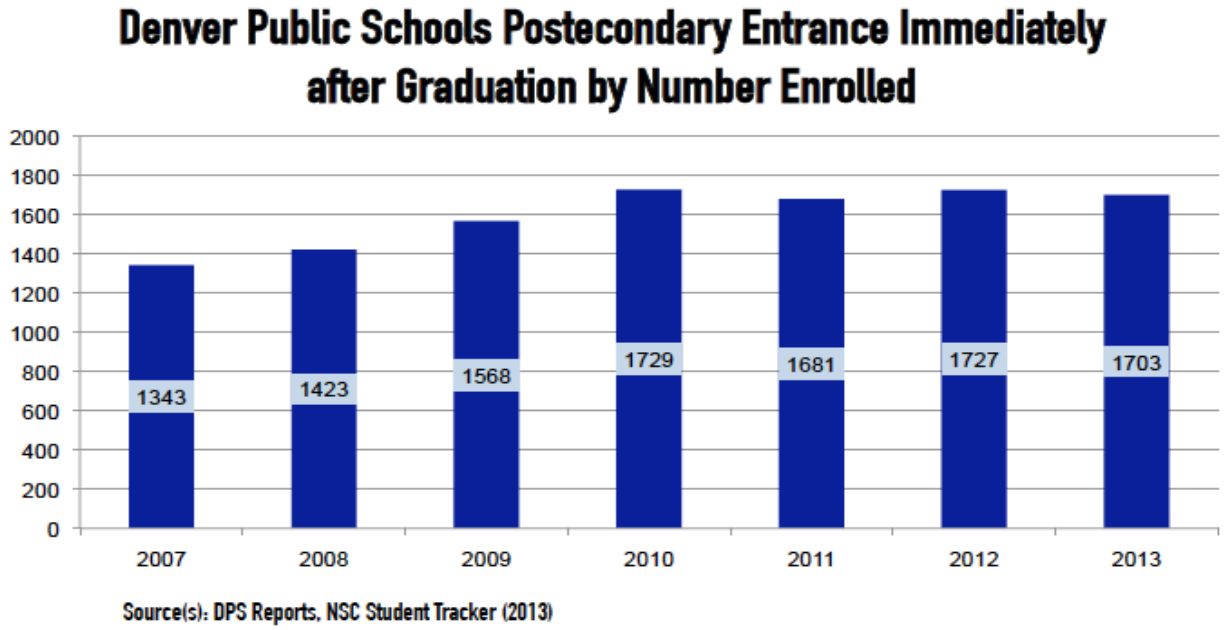
While momentum has increased in Colorado for improving postsecondary educational access and success, the state faces persistent challenges in meeting those objectives. In 2011, Colorado ranked 49th among the states in state and local public support per full-time student in public colleges. At the same time, in average tuition and fees for full-time students, Colorado is the 11th most expensive state in the country (NCHEMS, 2011). This gap between Colorado's public investment in higher education and the cost to students is staggering. No figures illustrate the outcome of this stark reality better than those called the "Colorado Paradox." The state ranks in the top five for the number of degree holders per capita, but only one in four current Colorado ninth graders will go on to earn a degree. For DPS students, the numbers are bleaker. In Denver, for every 100 ninth graders, 60 graduate high school four years later, 46 immediately enter college, 19 are still enrolled in their second year, and only eight get an associate or bachelor's degree in six years.

Given these inequities, a number of key policy and community actors have become increasingly engaged in the Denver education space. Groups like Teach for America rate Denver fourth out of 25 cities for reform-friendly environment. Community reform engagement in Denver, in just five years, grew the number of schools consistently placing students from low-income communities on a path to college from zero to 12. DSF's efforts are closely linked to this work.

The DSF approach is different and more targeted than other state and local scholarships and approaches aimed at increasing college participation. Many state programs attempted awarding aid to all students who meet certain academic qualifications. However, numerous researchers have demonstrated that this type of merit aid is more likely to be awarded to students from higher-income families in comparison to need-based awards, thus providing state and community resources to those students who would likely have attended college anyway (Heller, 2006; Cornwell, 2006). In particular, Heller and Rasmussen (2001) note that merit-based aid exacerbates long-recalcitrant racial disparities in college access and success. According to DPS, Hispanic and African American students make up roughly 68 percent of the graduates of DPS; additionally 70 percent of all district students qualify for free or reduced lunch. By investing in the academic futures of these students, DSF's awards will continue to pay dividends to the Denver community for many years to come.

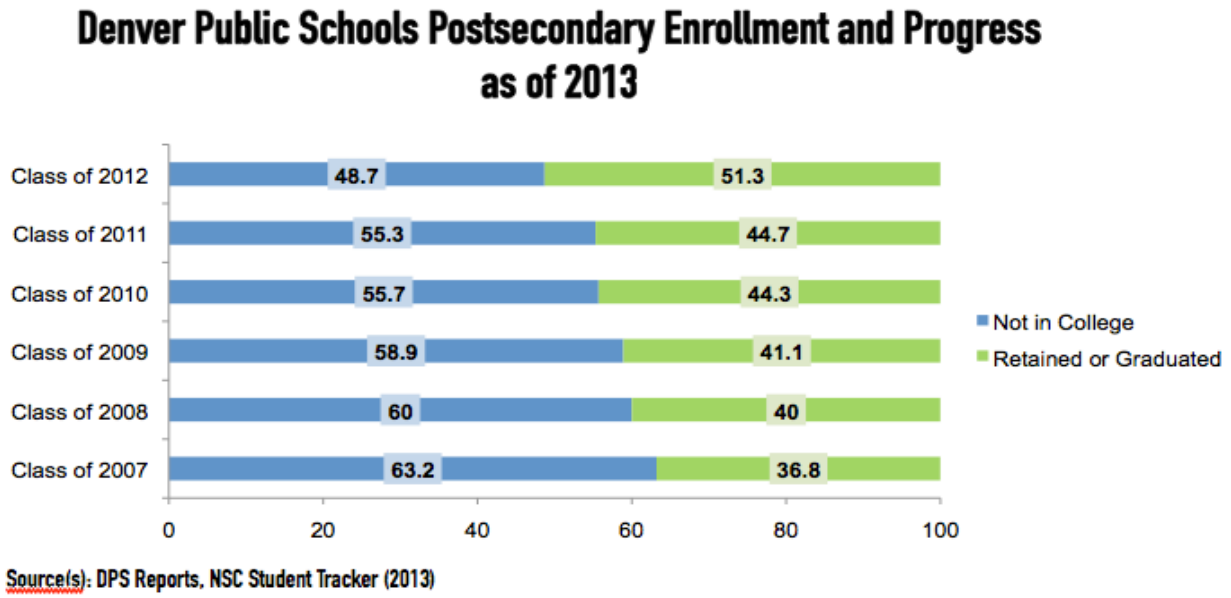
Since DSF's inception, many important and encouraging changes have taken place in the Denver Public Schools. In a 2014 *Denver Post* article, Superintendent Tom Boasberg attributed the district's improved performance to three things: higher expectations, personal attention from staff, and the Denver Scholarship Foundation, which holds the promise of financial aid for kids who move on to college. Graduation rates in the district have risen continuously over the past seven years. The district's four-year on-time graduation rate improved overall by 2.5 percentage points between 2012 and 2013, to 61.3 percent, amassing a 22 percentage point improvement since 2006-07. Additionally—and perhaps most notably—the number of students pursuing college immediately after graduation has increased by nearly 30 percent. A 2009 report by Buckley and Muraskin lamented the comparatively low college entrance rates of DPS students immediately following high school, so this is a most dramatic and welcome change. This increase in college going strengthens the case significantly for increased investment in DSF's efforts.


Denver Public Schools On-Time Graduation Rate
Graduation Rate
70
60
50
40
30
20
10
0
38.7
43.1
46.4
51.8
56.1
58.8
61.3
2007
2008
2009
2010
2011
2012
2013


Denver Public Schools Postecondary Entrance Immediately after Graduation by Number Enrolled
2000
1800
1600
1400
1200
1000
800
600
400
200
0
1343
1423
1568
1729
1681
1727
1703
2007
2008
2009
2010
2011
2012
2013
Source(s): DPS Reports, NSC Student Tracker (2013)

# Chapter 2: Cost-Benefit Analysis

While these changes represent the impact of great effort by DSF and others involved with Denver Public Schools, they do not provide a full picture of the value of DSF investment in DPS graduates. Another important, lesser-reported metric by which DSF can gauge its success is the increase in postsecondary retention and graduation rates district wide. Since 2006, DPS graduates have experienced an increase of 14.5 percentage points in the number of students either retained in college or completing a postsecondary credential.



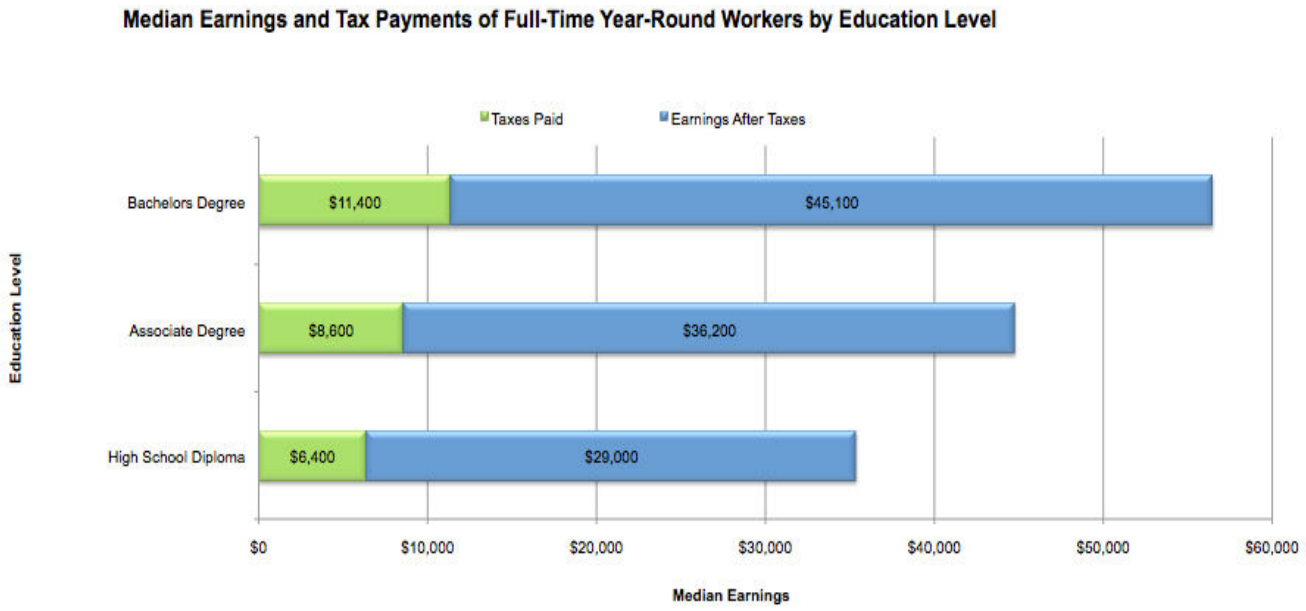

The DSF focus on leveraging their investment in Partnering Institutions for the provision of academic supportive services to scholars while they are pursuing their degree is a key part of the approach. This strategy is clearly producing success that has a ripple effect on this indicator of post-high school success for district graduates. Incredibly, DSF recipients are currently retained or graduated at a rate of 76 percent, besting the district rate by 24.7 percentage points. If the annual rate for each cohort of DPS graduates since 2007 who are either retained in college or continuing towards degree completion could be raised to match DSF performance, over 3,000 more students who entered college immediately following graduation during this period would have either earned a degree or would still be enrolled in college.

## Cost-Benefit Analysis of DSF Scholarships

DSF is primarily interested in determining the benefit of its investment of scholarships to scholars, given a return on that investment on several well-established societal outcomes of earning a college degree held in the higher education literature. Increasing the number of students who graduate from high school and eventually complete a postsecondary degree would create significant benefits for individuals, communities, states, and the nation as a whole. There are clear, quantifiable benefits to society when individuals participate in higher education. Society benefits from college graduates through increased tax revenue, decreased spending on public entitlement programs, reduced crime rates, and arguably greater productivity (Williams & Swail, 2005). College graduates are less likely to participate in government-funded programs like food stamps and are more likely to be civically engaged through community volunteerism (Baum, Ma & Payea, 2013). To establish a return ratio solely on total taxes paid—*including federal income, Social Security, Medicare, state and local income, sales, and property taxes*—the Pell

# Chapter 2: Cost-Benefit Analysis

Institute consulted 2013 U.S. Census Bureau estimates on the differences of Median Earnings and Tax Payments of Full-Time Year-Round Workers Ages 25 and Older, by Education Level.



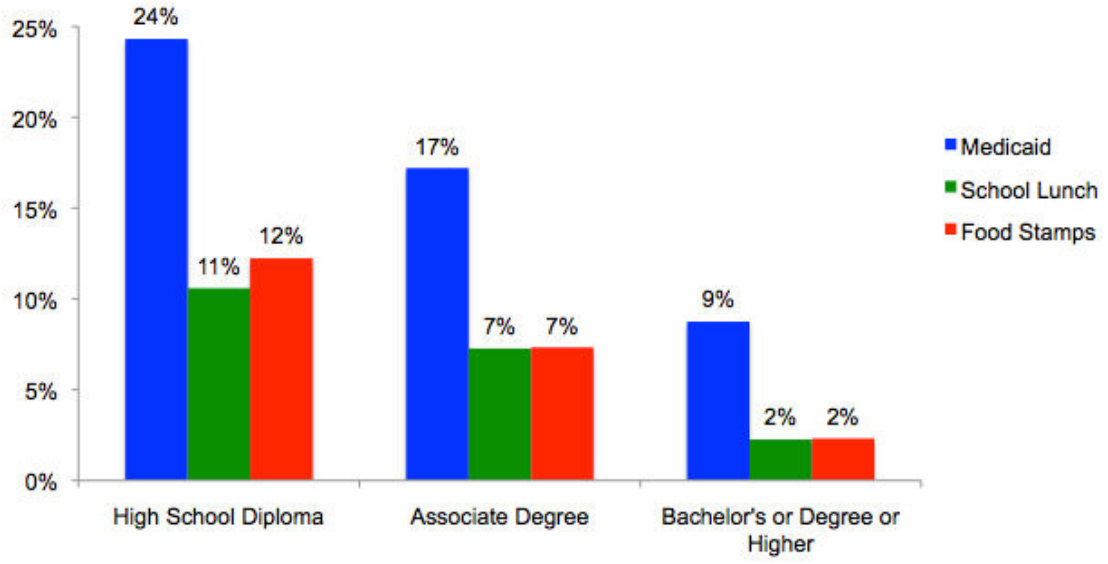

Nationally, bachelor's degree holders in the workforce pay $5,000 more in taxes and earn $16,100 more per year than those with only a high school diploma. Associate degree holders pay $2,200 more in taxes and earn $7,200 more per year. Because this analysis is focused on the benefit to the larger public, only the differences in taxes will be used in the cost-benefit calculation. To estimate the difference in taxes paid over a lifetime we made several assumptions. The first is of a 40-year work life for a high school graduate. The second was a reduction of years of work life for DSF recipients to account for time of attendance. A reduction of work life for the 4-year institution scholar by five years was taken to account for time of attendance and a reduction of work life by three years for 2-year institution scholars to account for time of attendance. The differences in estimated taxes paid were $62,200 for a scholar with an associate degree and $143,000 for a scholar with a bachelor's degree.

Next, using DSF-captured data on scholarship disbursements since 2007, the Pell Institute determined a mean annual scholarship amount for DSF recipients attending 4-year institutions ($3,247.64) and DSF recipients attending 2-year institutions ($1,645.70). While estimates could have been presented separately for 4-year and 2-year scholars, these estimates would not have yielded a complete picture of the return of DSF's combined efforts. When viewed separately, these estimates would have over-quantified the return for scholars who attended 2-year institutions. Instead, we used the breakdown of those scholars who pursued 4-year degrees (76 percent) and those who pursued 2-year degrees (24 percent) to provide a weighted average of the mean annual award ($2,863.17). To estimate the number of award years we assumed a 5-year award for a 4-year institution scholar and a 3-year award for a 2-year institution scholar, and yielded a weighted average of 4.52 award years.

To account for the weighted averages for scholarship award and award years, the estimated difference in taxes paid was also weighted and combined for an average difference in taxes paid. Using these estimates, we found the average DSF investment in a DSF graduate returns $9.59 for every $1.00 in scholarship, in taxes paid *(including federal income, Social Security, Medicare, state and local income, sales, and property taxes).*

There are other benefits to society when more high school graduates enter and complete college. In addition to the increased tax revenues federal, state, and local governments enjoy from college graduates, these individuals also rely less on income-support programs, providing a direct financial return on investments in postsecondary education. In 2011, 12 percent of high school graduates ages 25 and older lived in households that relied on SNAP (Supplemental Nutritional Assistance Program) benefits, compared to just 2 percent of those with at least a bachelor's degree. The pattern was similar for the National School Lunch Program and Medicaid.

**Percentage of Individuals Ages 25 and Older Living in Households Participating in Selected Public Assistance Programs, by Education Level**



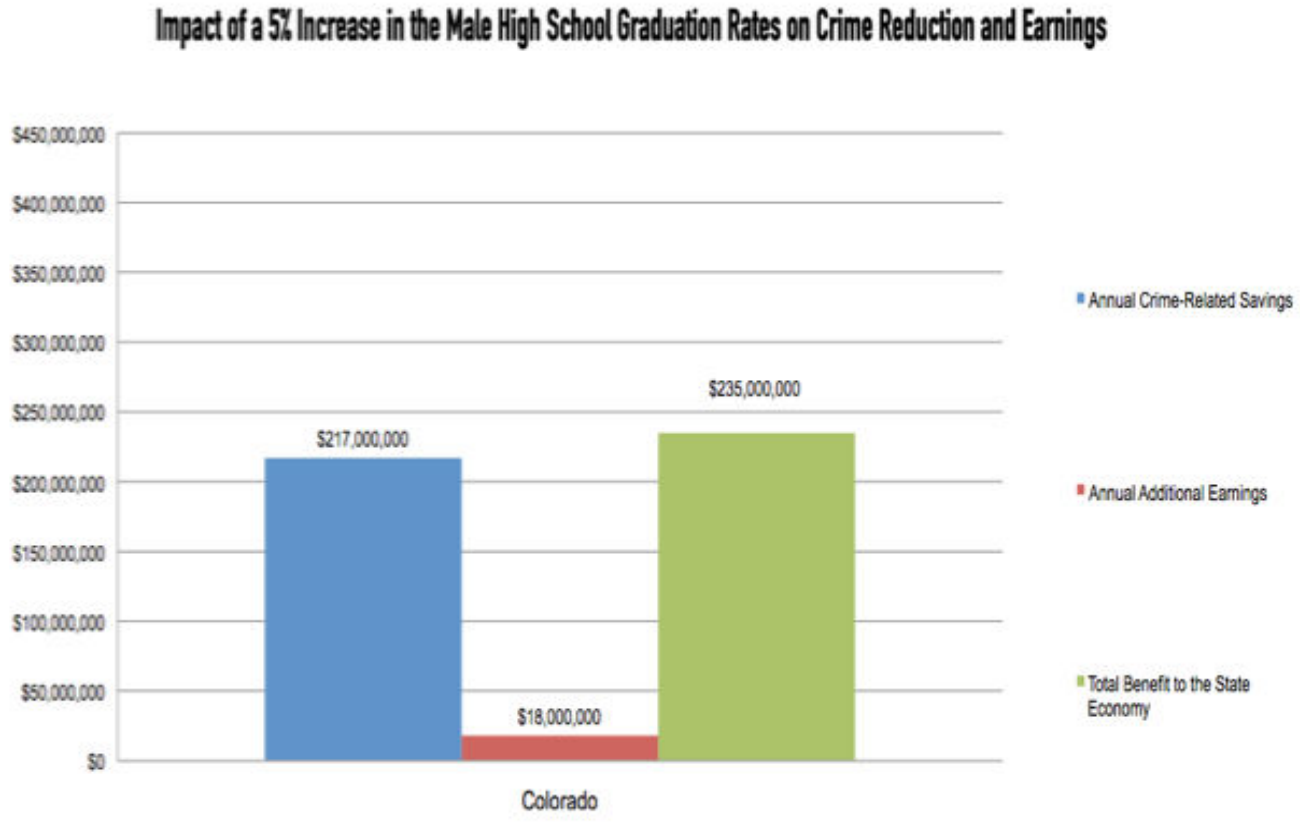

Source(s): U.S. Census Bureau, 2012a; calculations by the Pell Institute

There is a growing body of research that focuses on documenting the educational attainment of prisoners and explaining a link between low levels of educational attainment and high risks of incarceration. The literature clearly indicates that lower educational attainment is directly associated with increased arrest and incarceration rates, particularly in the case of males. A 2003 study by the U.S. Bureau of Justice Statistics on the education levels of state prisoners found that "male inmates were about twice as likely as their counterparts in the general population to not have completed high school or its equivalent." Additionally, the authors concluded that four times as many males in the general population had attended some college or other form of postsecondary education than those in prison.

DSF's leadership in investing in scholarships for low-income DPS graduates—who are largely African American and Hispanic—has potentially significant implications for reduction of crime and incarceration in the Denver area. The Bureau of Justice Statistics reports African Americans and Hispanics are the groups most widely represented in the criminal justice system; in 2010, African American and Hispanic males were in custody at rates of 4,347 and 1,775 per 100,000 U.S. residents, respectively, whereas just 678 white males were in custody per 100,000. The National Institute of Corrections reports the annual

cost for an inmate to Colorado taxpayers is $30,374. That **annual** cost for incarceration is 2.3 times higher than the **total** average award for a DSF scholarship recipient. If the Denver community could make a comparable investment in postsecondary opportunity as it does on incarceration, the result would be decreased criminal activity as well significantly increased life chances for the region's youth.

An Alliance for Excellent Education study estimates that a 5 percentage point increase in the national high school graduation rate for male students alone would save the nation an incredible $19.7 billion annually. That same study estimates that a 5 percentage point increase in the graduation rate for males in Colorado would save $217 million annually and those savings would be increased for every one of those men who went on to college. These savings and increased annual earnings are estimates only of increases in male high school graduation rates because incarceration rates of males are much higher than those of females. In 2009, men were imprisoned at a rate 14 times higher than women; 93 percent of prisoners in that year were male. Encouragingly, the DPS male graduation rate rose from 33 percent in 2007 to 57 percent in 2014.




**Source: Alliance for Excellent Education, 2013**

# Chapter 3: Regional Occupational Outlook

## Educational Outcomes of DSF Graduates

DSF has awarded scholarships to DPS students since the fall of 2007. By spring 2008, the first three DSF graduates achieved certificates through the program. Over the years, DSF graduates have attended colleges throughout the state and, in some cases, pursued and finished their education outside of Colorado. DSF tracks the graduation outcomes for students that have received DSF funding. This data includes the school, time of graduation, type of degree, and the field of study reported by each of these students. The most recent data at the time of this report was for spring 2014.

Development Research Partners standardized the fields of study data by assigning a code to each field using the Classification of Instructional Programs (CIP) system developed by the U.S. Department of Education, National Center for Educational Statistics. The dataset was screened for duplicate records, and sorted to include only the highest level of education achieved for each student. Overall, 750 students who have received educational support through DSF have completed a certificate, associate degree, bachelor's degree, master's degree, or a doctoral degree through spring 2014, as shown in Table 1.

About 66 percent of DSF graduates have completed a bachelor's or higher level degree, a key measure of educational attainment in state and federal statistics. Nearly 100 students completed degrees in science, technology, engineering, and mathematics (STEM) oriented fields as defined by the National Science Foundation (NSF). In addition, 85 students graduated with an education in health services. Eleven DSF graduates have gone on to complete master's degrees and one has completed a doctoral degree.

The largest percentage, about 13 percent, of students with known degree fields graduated with a certificate or degree in business, management, marketing, and related services. This is also true of graduates in Colorado as a whole. In Colorado, about 21 percent of graduates have a degree in business, management, and marketing. DSF graduates receiving business, management, and marketing degrees were followed by general liberal arts and sciences degrees (12.8 percent), health services (12.4 percent), social sciences (9.6 percent), and psychology (7.1 percent). The concentration of degrees in these fields closely resembles the distribution in Colorado where health services (14 percent) ranks second, general liberal arts and sciences (9.6 percent) ranks third, social sciences (5.1 percent) ranks fourth, and psychology (4.5 percent) ranks sixth.[4]

DSF predicts that it will award scholarships to an estimated 520 new students each year, based on the number of new scholarships granted over the last three years. DSF's objective is to have 85 percent of its scholarship recipients earn a certificate or higher-level degree. If DSF achieves this goal, the program will help 442 students earn certificates or degrees each year. The returns to education and economic outcomes of college graduates are well documented. DSF graduates will have improved occupational and wage outcomes, as well as boost the economy of the Denver region.

[4] Data available through the National Center for Education Statistics, Integrated Postsecondary Education Data System. Data is for Title IV participating schools in Colorado.

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**Table 1: Denver Scholarship Foundation Graduates by Field of Study and Highest Level of Education Earned, Fall 2007 to Spring 2014**

| Field | CIP Code | Certificates | Associate | Bachelor's | Master's | Doctorate | Total | Percent |
|---|---|---|---|---|---|---|---|---|
| Natural Resources and Conservation | 03.0000 | | | 1 | | | 1 | 0.1% |
| Architecture and Related Services | 04.0000 | 1 | | 7 | | | 8 | 1.1% |
| Area, Ethnic, Cultural, Gender, and Group Studies | 05.0000 | | | 9 | | | 9 | 1.2% |
| Communication, Journalism, and Related Programs | 09.0000 | | 1 | 33 | | | 34 | 4.5% |
| Communications Technologies/Technicians and Support Services | 10.0000 | | | | 1 | | 1 | 0.1% |
| Computer and Information Sciences and Support Services | 11.0000 | 3 | 2 | 7 | | | 12 | 1.6% |
| Personal and Culinary Services | 12.0000 | 14 | 5 | | | | 19 | 2.5% |
| Education | 13.0000 | 2 | | 1 | 2 | | 5 | 0.7% |
| Engineering | 14.0000 | | | 27 | | | 27 | 3.6% |
| Engineering Technology, General | 15.0000 | 1 | 2 | 1 | | | 4 | 0.5% |
| Foreign Languages, Literatures, and Linguistics | 16.0000 | | | 11 | | | 11 | 1.5% |
| Work and Family Studies | 19.0000 | 1 | | 7 | | | 8 | 1.1% |
| Legal Studies, General | 22.0000 | 1 | 1 | | | 1 | 3 | 0.4% |
| English Language and Literature/Letters | 23.0000 | | | 8 | | | 8 | 1.1% |
| Liberal Arts and Sciences, General Studies and Humanities | 24.0000 | | 82 | 6 | | | 88 | 11.7% |
| Library Science | 25.0000 | | | | 1 | | 1 | 0.1% |
| Biological and Biomedical Sciences | 26.0000 | | | 46 | | | 46 | 6.1% |
| Mathematics and Statistics | 27.0000 | | | 1 | 1 | | 2 | 0.3% |
| Multi-/Interdisciplinary Studies, General | 30.0000 | | | 15 | | | 15 | 2.0% |
| Parks, Recreation, Leisure, and Fitness Studies | 31.0000 | | | 5 | | | 5 | 0.7% |
| Philosophy and Religious Studies | 38.0000 | | | 2 | | | 2 | 0.3% |
| Physical Sciences | 40.0000 | | | 6 | | | 6 | 0.8% |
| Psychology | 42.0000 | | | 49 | | | 49 | 6.5% |
| Homeland Security, Law Enforcement, Firefighting, and Related Protecti | 43.0000 | 3 | 3 | 12 | | | 18 | 2.4% |
| Human Services, General | 44.0000 | | 4 | 7 | | | 11 | 1.5% |
| Social Sciences | 45.0000 | | | 66 | | | 66 | 8.8% |
| Mechanics and Repairers, General | 47.0000 | 4 | 8 | | | | 12 | 1.6% |
| Precision Production Trades, General | 48.0000 | 2 | | | | | 2 | 0.3% |
| Visual and Performing Arts | 50.0000 | 1 | 4 | 26 | | | 31 | 4.1% |
| Health Services/Allied Health/Health Sciences, General | 51.0000 | 43 | 7 | 32 | 3 | | 85 | 11.3% |
| Business, Management, Marketing, and Related Support Services | 52.0000 | 4 | 5 | 78 | 3 | | 90 | 12.0% |
| History | 54.0000 | | | 8 | | | 8 | 1.1% |
| Unknown | Unknown | 31 | 19 | 13 | | | 63 | 8.4% |
| Total | | 111 | 143 | 484 | 11 | 1 | 750 | 100.0% |
| Percent | | 14.8% | 19.1% | 64.5% | 1.5% | 0.1% | 100.0% | |

*Sources: Denver Scholarship Foundation; Development Research Partners.*

## Occupational Outcomes of DSF Graduates

After completing a certificate or degree program, DSF graduates will seek employment opportunities from a range of occupations. DSF does not track employment or occupational outcomes of its graduates except in a few instances. Estimating occupational outcomes is complicated by the incidence of many degree fields with skills that are transferable among several types of occupations. For instance, a degree in liberal arts may lead to a job in management, sales, production, transportation, or personal care and services depending on the job market and aptitude of the individual. In order to match degree fields with likely occupational outcomes, the research team conducted an analysis of U.S. Census Bureau public use micro data (PUMS) to match occupational groups with degree fields for people in the American Community Survey. The occupational breakouts by degree field are available for bachelor's or higher-level degrees. Degree fields for certificates or areas of study for individuals with some college completed are not available. Therefore, data for certificates and select degree fields were manually assigned an occupational group.[5]

[5] Certificates for welding were assigned to production occupations. Certificates in health care were assigned to healthcare support occupations. Unknown degrees were apportioned to degree fields based on the distribution for

# Chapter 3: Regional Occupational Outlook

The potential occupational mix for DSF graduates based on outcomes by degree field at a national level are detailed in Table 2. The predicted outcome for DSF graduates is compared with the occupational mix for both the Denver MSA and state of Colorado. Results of the analysis indicate that DSF graduates will have higher occupational concentrations in fields that require a higher education such as management, business and financial operation specialists, architecture and engineering, physical and social sciences, and education. DSF graduates will likely have lower concentrations in sales, office and administrative support, building and grounds maintenance, construction and extraction, maintenance and repair, production, food preparation and services, and transportation.

**Table 2: Denver Scholarship Foundation Graduates Estimated Occupational Outcomes and Denver MSA and Colorado Occupational Distributions**

| | Estimated DSF Grad Outcomes | | 2014 Denver MSA Occupations | | 2014 Colorado Occupations | |
|---|---|---|---|---|---|---|
| | Number | Percent | Number | Percent | Number | Percent |
| Management Occupations | 105 | 14.0% | 114,806 | 6.5% | 101,030 | 4.4% |
| Business and Financial Operation Specialists | 65 | 8.7% | 152,963 | 8.6% | 158,020 | 6.9% |
| Computer and Mathematical | 28 | 3.7% | 65,488 | 3.7% | 91,820 | 4.0% |
| Architecture and Engineering | 20 | 2.6% | 38,136 | 2.1% | 54,580 | 2.4% |
| Life, Physical, Social Science | 10 | 1.4% | 19,552 | 1.1% | 27,820 | 1.2% |
| Community and Social Service | 25 | 3.3% | 20,837 | 1.2% | 31,590 | 1.4% |
| Legal Occupations | 8 | 1.0% | 21,258 | 1.2% | 21,100 | 0.9% |
| Education, Training, and Library | 73 | 9.7% | 80,959 | 4.6% | 135,440 | 5.9% |
| Arts, Design, Entertainment, Sports, and Media | 31 | 4.1% | 62,384 | 3.5% | 35,560 | 1.5% |
| Healthcare Practitioners and Technical Occupations | 36 | 4.8% | 76,685 | 4.3% | 119,290 | 5.2% |
| Healthcare Support Occupations | 44 | 5.9% | 36,777 | 2.1% | 54,850 | 2.4% |
| Protective Service | 22 | 2.9% | 31,155 | 1.8% | 53,660 | 2.3% |
| Food Preparation and Serving Related | 25 | 3.3% | 123,853 | 7.0% | 218,920 | 9.5% |
| Building and Grounds Cleaning and Maintenance | 8 | 1.0% | 64,395 | 3.6% | 75,430 | 3.3% |
| Personal Care and Service | 24 | 3.2% | 79,144 | 4.5% | 68,700 | 3.0% |
| Sales and Related | 85 | 11.3% | 258,099 | 14.5% | 260,530 | 11.4% |
| Office and Administrative Support | 95 | 12.6% | 236,644 | 13.3% | 364,090 | 15.9% |
| Farming, Fishing, and Forestry | 1 | 0.2% | 2,948 | 0.2% | 4,020 | 0.2% |
| Construction and Extraction | 9 | 1.2% | 86,561 | 4.9% | 110,760 | 4.8% |
| Installation, Maintenance, and Repair | 7 | 0.9% | 57,899 | 3.3% | 86,190 | 3.8% |
| Production | 15 | 2.0% | 56,427 | 3.2% | 96,190 | 4.2% |
| Transportation and Material Moving | 16 | 2.1% | 91,512 | 5.1% | 125,420 | 5.5% |
| Totals | 750 | 100.0% | 1,778,482 | 100.0% | 2,295,010 | 100.0% |

*Source: Development Research Partners; U.S. Bureau of Labor Statistics, Occupational Employment Survey.*

DSF graduates will also be better represented in higher-paying occupations as occupations that require more education generally pay more. Management, business and financial operation specialists, computer and mathematical, architecture and engineering, physical and social sciences, and education are among the highest paying occupational groups based on median wages for the Denver MSA, as shown in Table 3.

Table 4 shows the distribution of occupational outcomes for a group of 442 DSF graduates based on estimates for graduates from 2007 to 2014. The table also includes the occupational outlook for each major occupational group including number of jobs, projected growth from 2014 to 2019, and the current state of the job market.

known degrees. Associate degrees are assumed to have occupational distributions similar to that of bachelor's degrees.

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Most DSF graduates will enter a stable or competitive job market. This includes the largest occupational groups for DSF graduates including management, sales, and office and administrative support. Occupational groups are classified in one of four categories (in demand, stable, competitive, and saturated) based on the saturation rate. The saturation rate is calculated as the number of applicants for a particular field as a percentage of jobs. For example, a stable market is defined as one in which job growth is matched by an adequate number of applicants to fill positions. A competitive market is one in which applicants will need to compete to fill a more limited number of positions.

From 2014 to 2019, the occupations with the largest absolute levels of projected job growth for the Denver MSA include sales (17,450), business and financial operation specialists (15,490), office and administrative support (15,400), food preparation and serving (15,040), and management occupations (11,370). Currently, these job markets are all either stable or competitive and present good job opportunities.

Another large portion of DSF graduates are expected to fill positions in education and related occupations. DSF graduates will likely enter education, training, and library occupations in higher concentrations than in the Denver MSA and Colorado, thereby meeting part of the demand for workers in one of the fastest growing and in-demand occupational fields. Education, training, and library occupations are expected to have a high level of absolute growth, increasing by more than 9,740 jobs by 2019. Among the top in-demand occupations in this occupational group are substitute teachers, special education teachers, and self-enrichment[6] education teachers.

**Table 3: Median Annual Wages by Occupation for the Denver MSA, 2013**

| Occupation | Median Annual Wage |
|---|---|
| Management | $111,090 |
| Legal | $82,910 |
| Computer and Mathematical | $82,430 |
| Architecture and Engineering | $80,650 |
| Healthcare Practitioners and Technical | $68,380 |
| Business and Financial Operations | $67,770 |
| Life, Physical, and Social Science | $63,660 |
| Education, Training, and Library | $46,600 |
| Arts, Design, Entertainment, Sports, and Media | $45,990 |
| Installation, Maintenance, and Repair | $45,190 |
| Community and Social Service | $43,390 |
| Construction and Extraction | $40,630 |
| **All Occupations** | **$39,960** |
| Protective Service | $36,980 |
| Office and Administrative Support | $35,560 |
| Production | $33,330 |
| Transportation and Material Moving | $32,040 |
| Healthcare Support | $30,840 |
| Sales and Related | $29,600 |
| Farming, Fishing, and Forestry | $26,200 |
| Building and Grounds Cleaning and Maintenance | $23,080 |
| Personal Care and Service | $21,620 |
| Food Preparation and Serving Related | $19,150 |

*Source: U.S. Bureau of Labor Statistics, Occupational Employment Statistics.*

From 2014 to 2019, the occupation with the fastest anticipated growth in the Denver MSA is healthcare support occupations. However, currently this market is also one of the most saturated occupational groups based on the number of applicants as a percentage of jobs in 2014. Within the group, some occupations are in demand, such as occupational therapy assistants, but the largest groups are among the most saturated, including medical assistants, phlebotomists, and other health care support workers.

[6] From the U.S. Bureau of Labor Statistics, self-enrichment education teachers teach or instruct courses other than those that normally lead to an occupational objective or degree. Examples include sailing instructors, horseback riding, or citizenship teachers.

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**Table 4: Denver Scholarship Foundation Estimated Annual Occupational Outcomes and Denver MSA Occupational Outlook Statistics**

| | | Occupational Outlook for Denver MSA (2014-2019) | | | | |
|---|---|---|---|---|---|---|
| | Annual DSF Graduates | Growth 2014-2019 | Annual Growth | Annual Openings | Saturation Rate (2014) | Demand Status |
| Management Occupations | 62 | 11,371 | 1.9% | 4,991 | 13% | Competitive |
| Business and Financial Operation Specialists | 38 | 15,488 | 1.9% | 6,432 | 5% | Stable |
| Computer and Mathematical | 16 | 5,844 | 1.7% | 2,313 | 9% | Stable |
| Architecture and Engineering | 12 | 3,239 | 1.6% | 1,666 | 8% | Stable |
| Life, Physical, Social Science | 6 | 2,358 | 2.3% | 1,097 | 7% | Stable |
| Community and Social Service | 15 | 2,228 | 2.1% | 961 | 15% | Competitive |
| Legal Occupations | 4 | 2,206 | 2.0% | 826 | 7% | Stable |
| Education, Training, and Library | 43 | 9,743 | 2.3% | 3,782 | 5% | In Demand |
| Arts, Design, Entertainment, Sports, and Media | 18 | 6,072 | 1.9% | 2,703 | 8% | Stable |
| Healthcare Practitioners and Technical Occupations | 21 | 10,938 | 2.7% | 3,947 | 2% | In Demand |
| Healthcare Support Occupations | 26 | 6,918 | 3.5% | 2,216 | 20% | Saturated |
| Protective Service | 13 | 2,300 | 1.4% | 1,448 | 7% | Stable |
| Food Preparation and Serving Related | 15 | 15,042 | 2.3% | 8,155 | 9% | Stable |
| Building and Grounds Cleaning and Maintenance | 5 | 5,944 | 1.8% | 2,633 | 11% | Competitive |
| Personal Care and Service | 14 | 9,972 | 2.4% | 3,859 | 5% | In Demand |
| Sales and Related | 50 | 17,446 | 1.3% | 10,542 | 7% | Stable |
| Office and Administrative Support | 56 | 15,402 | 1.3% | 8,426 | 19% | Competitive |
| Farming, Fishing, and Forestry | 1 | 108 | 0.7% | 121 | 23% | Saturated |
| Construction and Extraction | 5 | 2,763 | 0.6% | 2,685 | 9% | Stable |
| Installation, Maintenance, and Repair | 4 | 2,760 | 0.9% | 2,169 | 7% | Stable |
| Production | 9 | 1,586 | 0.6% | 1,891 | 16% | Competitive |
| Transportation and Material Moving | 9 | 4,347 | 0.9% | 3,244 | 9% | Stable |
| Totals | 442 | 154,075 | 1.7% | 76,107 | | |

*Sources: Denver Scholarship Foundation; Development Research Partners; EMSI; saturation rate based on methodology developed by Arapahoe/Douglas Works!*

*Note: Saturation rate calculated as the percentaage of available applicants to 2014 jobs. The saturation rate measures demand status based on the following: less than 5% equals "In Demand," 5.1% to 10% equals "Stable," 10.1% to 20% equals "Competitive," over 20% is "Saturated."*

The second-fastest growing field is also in health care, but includes healthcare practitioners and technical occupations such as doctors, nurses, dentists, chiropractors, pharmacists, therapists, and veterinarians. Unlike healthcare support, healthcare practitioners and technical occupations are currently in demand with a low saturation rate. From 2014 to 2019, 10,940 more jobs are expected in this field. Several occupations in this group are among the most in-demand occupations in the Denver MSA, including podiatrists, exercise physiologists, anesthesiologists, and speech and language pathologists. While lower than the percentage of people in these occupations than Colorado as a whole, DSF graduates entering healthcare practitioner and technical occupations will likely exceed the percentage in the Denver MSA and help to meet demand for skilled workers in the region.

Tables 5 and 6 outline the 20 most in-demand and 20 most saturated occupations in the Denver MSA based on the saturation rate. The occupational categories represent detailed occupations rather than occupational groups. Based on the data below, most of the job openings in the top in-demand occupations are for business and financial operation specialists. This group includes market research analysts, marketing specialists, and personal financial advisors. The other top occupational group is sales, including real estate sales agents.

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As previously mentioned, the most saturated occupations with the most applicants in the Denver MSA include healthcare support occupations such as phlebotomists and other healthcare support workers. Based on the number of applicants, food preparation and cooking occupations are also saturated. Another large category includes building and grounds cleaning and maintenance occupations such as grounds maintenance workers and building cleaning workers.

A description of the projected growth in industry sectors in the Denver MSA gives more perspective to the economic outlook for DSF graduates. The sector with one of the highest wages and fastest projected growth rates is in management of companies and enterprises, which includes company headquarters operations. The Colorado Department of Labor and Employment projects the sector will grow 6.3 percent each year from 2013 to 2023. The education achieved by DSF graduates is expected to expand the pool of talent in managerial occupations that will ultimately meet demand for employees in sectors such as this.

In addition, the fast pace of growth expected for healthcare occupations is reaffirmed in industry data that indicates the health care and social assistance sector will grow at a 3 percent annual pace, making it the fifth fastest growing sector from 2013 to 2023. In terms of absolute growth, the sector is expected to add over

**Table 5: Top 20 Occupations in Demand in Metro Denver, 2014**

| | 2014 Jobs | Annual Openings | Available Applicants | Saturation Rate |
|---|---|---|---|---|
| Market Research Analysts and Marketing Specialists | 7,342 | 357 | 0 | 0.0% |
| Fundraisers | 776 | 32 | 0 | 0.0% |
| Substitute Teachers | 600 | 81 | 0 | 0.0% |
| Food Processing Workers, All Other | 467 | 21 | 0 | 0.0% |
| Financial Clerks, All Other | 384 | 18 | 0 | 0.0% |
| Podiatrists | 250 | 20 | 0 | 0.0% |
| Special Education Teachers, All Other | 242 | 12 | 0 | 0.0% |
| Exercise Physiologists | 201 | 9 | 0 | 0.0% |
| Farm and Home Management Advisors | 102 | 4 | 0 | 0.0% |
| Morticians, Undertakers, and Funeral Directors | 90 | 4 | 0 | 0.0% |
| Emergency Management Directors | 63 | 2 | 0 | 0.0% |
| Subway and Streetcar Operators | 35 | 0 | 0 | 0.0% |
| Paralegals and Legal Assistants | 4,555 | 206 | 10 | 0.2% |
| Anesthesiologists | 320 | 16 | 1 | 0.3% |
| Self-Enrichment Education Teachers | 6,498 | 293 | 21 | 0.3% |
| Speech-Language Pathologists | 1,893 | 81 | 7 | 0.4% |
| Personal Financial Advisors | 25,357 | 1,729 | 105 | 0.4% |
| Internists, General | 638 | 26 | 3 | 0.5% |
| Real Estate Sales Agents | 39,217 | 1,112 | 195 | 0.5% |
| Public Address System and Other Announcers | 768 | 36 | 4 | 0.5% |

Source: Arapahoe/Douglas Works!

Note: Saturation rate calculated as the percentage of available applicants to 2014 jobs. The saturation rate measures demand status based on the following: less than 5% equals "In Demand," 5.1% to 10% equals "Stable," 10.1% to 20% equals "Competitive," over 20% is "Saturated."

**Table 6: Top 20 Saturated Occupations in Metro Denver, 2014**

| | 2014 Jobs | Annual Openings | Available Applicants | Saturation Rate |
|---|---|---|---|---|
| Grounds Maintenance Workers, All Other | 77 | 5 | 674 | 875.3% |
| Forest and Conservation Workers | 25 | 2 | 129 | 516.0% |
| Telephone Operators | 62 | 3 | 275 | 443.5% |
| Food Preparation and Serving Related Workers, All Other | 185 | 17 | 744 | 402.2% |
| Cooks, Private Household | 14 | 0 | 55 | 392.9% |
| Cooks, All Other | 161 | 8 | 504 | 313.0% |
| Judges, Magistrate Judges, and Magistrates | 251 | 6 | 650 | 259.0% |
| Hunters and Trappers | 12 | 0 | 29 | 241.7% |
| Building Cleaning Workers, All Other | 209 | 9 | 463 | 221.5% |
| Pharmacy Aides | 60 | 3 | 126 | 210.0% |
| Political Scientists | 16 | 16 | 32 | 200.0% |
| Phlebotomists | 954 | 57 | 1,788 | 187.4% |
| Dentists, All Other Specialists | 36 | 0 | 56 | 155.6% |
| Counselors, All Other | 196 | 10 | 300 | 153.1% |
| Healthcare Support Workers, All Other | 1,041 | 47 | 1,537 | 147.6% |
| Radio Operators | 11 | 0 | 16 | 145.5% |
| Training and Development Managers | 252 | 13 | 341 | 135.3% |
| Mathematicians | 37 | 2 | 46 | 124.3% |
| Mathematical Science Occupations, All Other | 16 | 0 | 18 | 112.5% |
| Buyers and Purchasing Agents, Farm Products | 50 | 1 | 52 | 104.0% |

Source: Arapahoe/Douglas Works!

Note: Saturation rate calculated as the percentage of available applicants to 2014 jobs. The saturation rate measures demand status based on the following: less than 5% equals "In Demand," 5.1% to 10% equals "Stable," 10.1% to 20% equals "Competitive," over 20% is "Saturated."

51,000 jobs, the second highest overall after professional, scientific, and technical services (61,100). While DSF graduates currently obtain health care-related degrees in proportion to the Denver MSA and Colorado overall, this may be an area where the program will enable more students to go into this industry moving forward.

Another sector that requires a highly educated workforce is professional, scientific, and technical services. This is the second fastest-growing sector according to projections, with employment increasing at an annual rate of 4.4 percent each year. This sector will have the highest absolute growth in employment, increasing by more than 61,100 jobs, or about one-sixth of the overall growth in the Denver MSA over the next 10 years.

**Table 7: Denver MSA Long-Term Employment Projections by Industry Sector, 2013-2023**

| | 2013 | 2023 | Change | Percent | Annual |
|---|---|---|---|---|---|
| Agriculture, Forestry, Fishing and Hunting | 2,052 | 2,083 | 31 | 1.5% | 0.2% |
| Mining, Quarrying, and Oil and Gas Extraction | 11,310 | 16,620 | 5,310 | 46.9% | 3.9% |
| Utilities | 3,521 | 2,910 | -611 | -17.4% | -1.9% |
| Construction | 69,161 | 103,335 | 34,174 | 49.4% | 4.1% |
| Manufacturing | 63,783 | 67,612 | 3,829 | 6.0% | 0.6% |
| Wholesale Trade | 65,233 | 77,364 | 12,131 | 18.6% | 1.7% |
| Retail Trade | 128,549 | 153,394 | 24,845 | 19.3% | 1.8% |
| Transportation and Warehousing | 45,516 | 56,177 | 10,661 | 23.4% | 2.1% |
| Information | 44,065 | 46,081 | 2,016 | 4.6% | 0.4% |
| Finance and Insurance | 71,139 | 83,734 | 12,595 | 17.7% | 1.6% |
| Real Estate and Rental and Leasing | 24,639 | 30,840 | 6,201 | 25.2% | 2.3% |
| Professional, Scientific, and Technical Services | 114,717 | 175,857 | 61,140 | 53.3% | 4.4% |
| Management of Companies and Enterprises | 28,115 | 51,631 | 23,516 | 83.6% | 6.3% |
| Administrative and Support and Waste Management a | 90,096 | 118,701 | 28,605 | 31.7% | 2.8% |
| Educational Services | 100,203 | 119,818 | 19,615 | 19.6% | 1.8% |
| Health Care and Social Assistance | 148,396 | 199,510 | 51,114 | 34.4% | 3.0% |
| Arts, Entertainment, and Recreation | 21,509 | 25,048 | 3,539 | 16.5% | 1.5% |
| Accommodation and Food Services | 120,012 | 153,564 | 33,552 | 28.0% | 2.5% |
| Other Services (except Public Administration) | 52,403 | 58,669 | 6,266 | 12.0% | 1.1% |
| Federal, State, and Local Government | 183,238 | 208,630 | 25,392 | 13.9% | 1.3% |
| | 1,387,657 | 1,751,578 | 363,921 | 26.2% | 2.4% |

*Source: Colorado Department of Labor and Employment, Labor Market Information.*

A study from the U.S. Census Bureau notes that educational attainment is the most important predictor of earnings (Tiffany, 2012). Greater earnings have a large impact on the financial outcomes of individuals, especially when compounded over the course of one's work life. Further, the study notes that occupational outcomes are another significant influence. Management, business and financial operation specialists, computer and mathematical, architecture and engineering, healthcare practitioners and technicians, sales, and science earn more in a work life than the average bachelor's degree recipient does. The fundamental economic benefits of DSF's program are based on this concept, that better educational and occupational outcomes lead to more earnings and increased economic activity in the Denver region.

# Chapter 4: Economic Impact

The students who graduate with a certificate or degree each year because of a DSF scholarship will have better earnings outcomes, lower unemployment rates, and better career opportunities than if they had merely graduated from high school. Many of these outcomes are well documented. The latest data from the U.S. Bureau of Labor Statistics indicates that unemployment rates decline and median earnings increase based on higher levels of educational attainment. In 2013, people with doctoral degrees had an unemployment rate of 2.2 percent compared with 7.5 percent for high school graduates, and had median earnings about 2.5 times greater.

**Table 8: U.S. Earnings and Unemployment Rates by Educational Attainment for the Population 25 Years and Over, 2013**

| Education attained | Rate (%) | Median weekly earnings |
|---|---|---|
| Doctoral degree | 2.2 | $1,623 |
| Professional degree | 2.3 | $1,714 |
| Master's degree | 3.4 | $1,329 |
| Bachelor's degree | 4.0 | $1,108 |
| Associate degree | 5.4 | $777 |
| Some college, no degree | 7.0 | $727 |
| High school diploma | 7.5 | $651 |
| Less than a high school diploma | 11.0 | $472 |
| All Workers | 6.1 | $827 |

*Source: U.S. Bureau of Labor Statistics, Employment Projections, Earnings and Unemployment Rates by Educational Attainment.*
*Note: Civilian, noninstitutionalized population.*

Education also leads to job opportunities in better-paying occupations. Based on median wages by occupation for the Denver MSA and occupational outcomes by degree field from U.S. Census Bureau data, DSF recipients are more likely to be represented in occupations that pay more than the regional median. DSF recipients will likely have higher concentrations of employment in nine of 12 occupations with wages higher than the overall median, including management, business and financial operation specialists, computer and mathematical occupations, and architecture and engineering.

The higher earning potential of DSF recipients from better-paying jobs and lower unemployment rates represents an increase in the economic output of the Denver region. This increase is driven by the benefit of more spending on local goods and services such as retail, housing, and personal services. As DSF recipients begin their careers in the Denver region and Colorado, their employment and spending patterns also have multiplicative impacts on businesses, organizations, and individuals affected as the spending works its way through the economy. Multiplier analysis recognizes the interdependence of various sectors of the economy as activities in one sector spill over into other sectors, stimulating business activity.

The multiplicative effects are discussed in terms of "indirect" and "induced" impacts (often collectively referred to as simply indirect impacts). When a DSF recipient purchases consumer goods from a local business, that local business in turn provides payroll to its employees and makes purchases from other vendors. These other vendors in turn provide payroll to their employees, make purchases from other vendors, and so on, creating the indirect impact of the initial dollar spent. On a separate but similar spending track, when employees of the vendor operations spend their paychecks at local businesses, these local businesses provide payroll to their employees, make purchases from other vendors, and so on, creating the induced impact. In other words, the initial dollars spent by DSF recipients on purchases are circulated throughout the economy a number of times.

# Chapter 4: Economic Impact

The number of times that the initial dollars are circulated throughout the economy is estimated using economic multipliers. The indirect and induced jobs and income flows generated by the direct spending patterns are estimated using economic multipliers that are industry-specific for the Denver region.[7]

There are three types of economic impacts discussed. First, the direct and indirect impact of the spending on the gross output of the region is estimated. This is the total value of the output produced by the local firms and residents resulting from the increased graduate spending directly. Gross output includes the value of both intermediate goods and final products, so this is a larger value than gross domestic product (GDP) for the region. Second, the total direct and indirect employment needed in the region to produce this level of output is determined. These employees may be full-time or part-time, local or non-local workers. It should be noted that the indirect employment supported might represent fractions of jobs, added to reflect whole positions. Third, the analysis includes an estimate for the typical direct and indirect earnings associated with this level of production.

The economic benefits for three scenarios are reported in this study, one based on the assumption that 80 percent of DSF recipients live and work in the Denver region, one based on 90 percent residency, and the final based on 100 percent residency.

## DSF Recipient Employment

- DSF expects to award scholarships to an estimated 520 new students each year. The difference in employment potential for these 520 scholarship recipients is based on the difference in average annual unemployment rates by educational attainment (Table 8).
- The base analysis assumes that these 520 individuals would have only attained a high school diploma or the equivalent if they had not received a DSF scholarship. Assuming that 100 percent of these individuals remain in Denver and are in the labor force (either working or actively pursuing a job), a 7.5 percent average annual unemployment rate for those with a high school diploma as their highest level of educational attainment results in an estimated 39 unemployed individuals. The number of employed, therefore, ranges from 481 in the 100 percent scenario to 385 in the 80 percent scenario, as shown in Table 9.
- With a DSF scholarship, it is assumed that 85 percent of these 520 individuals will receive a certificate or higher. The remaining 15 percent will have completed some level of postsecondary education, but will not have received a degree or certificate. The 442 DSF recipients who receive a certificate or higher are distributed among the different educational attainment levels as indicated in Table 1.
- The rate of unemployment for those who have completed at least some level of postsecondary education ranges from 7 percent for those who completed some college, no degree to 2.2 percent for those who received a doctorate degree, as shown in Table 8. Assuming that 100 percent of these individuals remain in or return to Denver and are in the labor force (either working or actively pursuing a job), an estimated 26 individuals will still likely be unemployed. The number of employed, therefore, ranges from 494 in the 100 percent scenario to 395 in the 80 percent scenario, as shown in Table 9.

[7] This analysis utilizes the Regional Input-Output Modeling System II (RIMS II) multipliers developed by the U.S. Department of Commerce, Bureau of Economic Analysis. The multipliers describe a seven-county Metro Denver region consisting of Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, and Jefferson Counties.

# Chapter 4: Economic Impact

- If 100 percent of the 520 individuals remain in or return to Denver, 13 more will likely be employed because of a DSF scholarship. An additional 12 individuals would be employed in the 90 percent scenario and 10 more in the 80 percent scenario.

**Table 9: Earnings and Employment Outcomes of 520 Students**

| Remain in/Return to Denver After Graduation | 100% | 90% | 80% |
|---|---|---|---|
| **Base Case: No DSF Scholarships** | | | |
| High School Diploma | 520 | 468 | 416 |
| **Unemployment Rate** | | | |
| High School Diploma | 7.5% | 7.5% | 7.5% |
| Employed | 481 | 433 | 385 |
| Unemployed | 39 | 35 | 31 |
| **Average Annual Salary** | | | |
| High School Diploma | $35,800 | $35,800 | $35,800 |
| Total Earnings | $17,219,900 | $15,497,900 | $13,775,900 |
| **DSF Scholarship Recipients** | | | |
| Some College, No Degree | 78 | 70 | 62 |
| Certificate | 65 | 59 | 52 |
| Associate | 84 | 76 | 67 |
| Bachelor's | 285 | 257 | 228 |
| Master's | 6 | 6 | 5 |
| Doctorate | 1 | 1 | 0 |
| **Total** | **520** | **468** | **416** |
| **Unemployment Rate** | | | |
| Some College, No Degree | 7.0% | 7.0% | 7.0% |
| Certificate | 7.0% | 7.0% | 7.0% |
| Associate | 5.4% | 5.4% | 5.4% |
| Bachelor's | 4.0% | 4.0% | 4.0% |
| Master's | 3.4% | 3.4% | 3.4% |
| Doctorate | 2.2% | 2.2% | 2.2% |
| Employed | 494 | 444 | 395 |
| Unemployed | 26 | 24 | 21 |
| **Average Annual Salary** | | | |
| Some College, No Degree | $35,800 | $35,800 | $35,800 |
| Certificate | $38,040 | $38,040 | $38,040 |
| Associate | $39,990 | $39,990 | $39,990 |
| Bachelor's | $60,830 | $60,830 | $60,830 |
| Master's | $71,340 | $71,340 | $71,340 |
| Doctorate | $85,550 | $85,550 | $85,550 |
| **Total Earnings** | $25,251,700 | $22,726,600 | $20,432,800 |
| **DSF Results in Higher Direct Employment and Earnings** | | | |
| Additional Employed | 13 | 11 | 10 |
| Additional Total Earnings | $8,031,800 | $7,228,700 | $6,656,900 |

*Source: Development Research Partners.*

# Chapter 4: Economic Impact

## DSF Recipient Earnings

- The difference in earnings potential for the 520 scholarship recipients is based on the difference in average annual salaries by occupational group by educational attainment.
- The base analysis assumes that these 520 individuals would have only attained a high school diploma or the equivalent if they had not received a DSF scholarship. Estimates from the U.S. Bureau of Labor Statistics indicate that people with only a high school diploma earn about 78.7 percent of the median wage for all workers. Assuming that 100 percent of these individuals remain in Denver, the 481 that are working would be distributed among the occupational groups according to the current Denver MSA occupational group distribution. This distribution results in an average annual salary for high school graduates of $35,800. The total annual earnings, therefore, ranges from $17.2 million in the 100 percent scenario to $13.8 million in the 80 percent scenario, as shown in Table 9. It should be noted that earnings reflect the RIMS II definition of earnings that include wage and salary income as well as employee benefits that are likely to impact the local area, such as supplemental pay.[8]
- The earnings potential of DSF recipients is higher than those with only a high school diploma. DSF recipients achieve greater earnings through a more favorable occupational mix, and higher salaries and lower unemployment rates based on the level of educational attainment. Based on median wages by occupational group and educational attainment from the U.S. Census Bureau's American Community Survey, unemployment rates for varying levels of educational attainment, and compensation data from the U.S. Bureau of Labor Statistics, annual earnings for DSF recipients will total an estimated $25.3 million if 100 percent of the individuals return to or remain in Denver. Total annual earnings are estimated to be $22.7 million in the 90 percent scenario and $20.4 million in the 80 percent scenario, as shown in Table 9.
- If 100 percent of the 520 individuals remain in or return to Denver, their total annual earnings will likely be $8.0 million more than if they had received just a high school diploma. Total annual earnings would be $7.2 million more in the 90 percent scenario and $6.7 million more in the 80 percent scenario.

## Direct Spending Benefits

- Under the 100 percent scenario, an increase of $8.0 million in annual earnings in the regional economy would boost the output of the region as businesses respond to the increase in demand and higher spending power. Estimates of industries that would benefit from the increase in spending were derived from household spending patterns captured in the U.S. Bureau of Labor Statistics, Consumer Expenditure Survey. In addition, the percentage of earnings that would likely represent "leakage" from the economy, including savings, taxes, and spending outside of the region, were estimated from this data. Based on these results, $8.0 million in additional annual earnings would result in $6.5 million in additional spending in the Denver region each year.
- Since this entire $6.5 million in annual spending does not have multiplier impacts in the region, the direct benefit to the region is reduced accordingly. Based on an analysis of the retail margins associated with spending in retail trade categories, only about 31 percent of the retail spending actually goes towards local wages and indirect business purchases. The remaining 69 percent received by the retailers represents the cost of goods sold, dollars that generally exit the region as retailers pay

[8] Earnings impacts are based on the portion of total compensation (including wages, salaries, and employee benefits) that is likely to be spent locally and includes wages and salaries, supplemental pay, and a portion of insurance benefits. Earnings were estimated based on data from the U.S. Bureau of Labor Statistics, National Compensation Survey.

for their inventory. Spending was also adjusted to exclude payments for home mortgages as these reflect transfer payments and have a small or negligible economic benefit. The result is that the $6.5 million in annual spending has a direct economic benefit of about $3.7 million in the Denver region each year.

- Household spending benefits a broad range of industry subsectors including utilities, retail trade, financial and insurance services, educational services, social assistance, and charitable organizations. The largest amount of spending, about $1.9 million, will benefit businesses in retail trade industries. The second largest spending category is for housing ($1.5 million). Other significant spending categories include amusements, gambling, and recreation ($353,000), food services and drinking places ($351,000), utilities ($276,000), and repair and maintenance ($229,000).
- An increase in annual earnings of $7.2 million in the 90 percent scenario results in increased spending of $5.9 million, which has a direct economic benefit of $3.4 million. The direct economic benefit in the 80 percent scenario is $3 million, based on $6.7 million in additional annual earnings of which $5.2 million represents increased local spending.

## Direct, Indirect, and Induced Benefits

- ***Value of Output:*** In the 100 percent scenario, the total direct value of additional output associated with the additional annual spending by DSF recipients in the Denver region is $3.7 million per year. Based on the RIMS II multipliers, $3.7 million in household spending will likely support $4.4 million in additional output in all industries throughout the metro region. Therefore, the total direct and indirect benefit of DSF recipients' spending is $8.1 million in total annual output ($3.7 million direct output + $4.4 million indirect and induced output), as shown in Table 10.
- The total direct and indirect value of output resulting from the additional spending by DSF recipients is slightly lower in the 90 percent scenario, dropping to $7.3 million. Under the 80 percent scenario, the output value totals $6.5 million, as shown in Table 10.
- ***Employment:*** Under the 100 percent scenario, businesses that capture a part of the increased spending by DSF recipients will directly employ about 34 workers. Based on the RIMS II multipliers, the production of the $4.4 million in indirect and induced output in all industries throughout the Denver region will require about 32 employees. Therefore, the additional spending by DSF recipients supports the employment of 66 additional workers in the Denver region each year (34 direct employees + 32 indirect employees), as shown in Table 10.
- The total direct and indirect employment benefit of DSF recipients' spending is slightly lower in the 90 percent scenario, dropping to 60 workers. Under the 80 percent scenario, the value totals 53 workers, as shown in Table 10.
- ***Earnings:*** Under the 100 percent scenario, the employees directly supported by the increased spending associated with DSF recipients will have associated earnings of $1.1 million. Based on the relationships revealed through the RIMS II multipliers, the 32 indirect employees who produce the $4.4 million in indirect and induced output have associated earnings of about $1.3 million. As a result, the 66 direct and indirect employees have estimated earnings of $2.4 million ($1.1 million direct earnings + $1.3 million indirect earnings), as shown in Table 10. All earnings values are included in the total value of output; earnings are not in addition to the value of output.
- The total direct and indirect earnings of the additional employees is slightly lower in the 90 percent scenario, dropping to $2.2 million. Under the 80 percent scenario, the value drops to $1.9 million, as shown in Table 10.

# Chapter 4: Economic Impact

**Table 10: Annual Economic Benefit of DSF Recipients in the Denver Region**

| | | New Economic Activity | | |
|---|---|---|---|---|
| | Increased Spending | Direct Impact | Indirect + Induced Impact | Total Impact |
| Output (100% Residents) | $6,505,000 | $3,733,000 | $4,382,000 | $8,115,000 |
| Earnings | | $1,137,000 | $1,259,000 | $2,396,000 |
| Employment | | 34 | 32 | 66 |
| Output (90% Residents) | $5,854,000 | $3,360,000 | $3,943,000 | $7,303,000 |
| Earnings | | $1,023,000 | $1,133,000 | $2,156,000 |
| Employment | | 31 | 29 | 60 |
| Output (80% Residents) | $5,204,000 | $2,986,000 | $3,505,000 | $6,491,000 |
| Earnings | | $910,000 | $1,007,000 | $1,917,000 |
| Employment | | 27 | 26 | 53 |

*Calculation Note: (Total Impact) = (Direct Impact) + (Indirect + Induced Impact)*
*Note: Direct impacts are spending adjusted by the retail margin for likely spending at businesses in retail industries, or the amount of spending that actually contributes towards local wages and indirect business purchases.*
*Source: Development Research Partners, based on multipliers for the Metro Denver region from the U.S. Department of Commerce, Bureau of Economic Analysis, Regional Input-Output Modeling System (RIMS II), 2002 U.S. benchmark I-O data and 2010 regional data.*

# Chapter 5: Sales Tax Benefit

In addition to the economic benefits associated with a more highly educated workforce in the Denver region, there will be fiscal benefits for the City and County of Denver. DSF recipients who remain in or return to Denver generate additional sales tax revenue for the city as they spend their additional earnings.

Table 11 details how the additional earnings received by DSF recipients will be spent by industry in the Denver region.

**Table 11: Spending Benefits by Industry of DSF Recipient in the Denver Region**

| | Increased Demand | | |
|---|---|---|---|
| Industry | 100% | 90% | 80% |
| Utilities | $275,600 | $248,000 | $220,500 |
| Retail Trade | $1,902,400 | $1,712,200 | $1,521,900 |
| Transit and Ground Passenger Transportation | $82,200 | $74,000 | $65,700 |
| Publishing Industries, Except Internet | $7,200 | $6,500 | $5,700 |
| Telecommunications | $150,500 | $135,400 | $120,400 |
| Credit Intermediation and Related Activities | $96,000 | $86,400 | $76,800 |
| Housing | $1,452,300 | $1,307,100 | $1,161,800 |
| Insurance Carriers | $1,061,900 | $955,700 | $849,500 |
| Educational Services | $139,700 | $125,700 | $111,700 |
| Ambulatory Health Care Services | $118,700 | $106,800 | $94,900 |
| Social Assistance | $39,200 | $35,200 | $31,300 |
| Amusements, Gambling, and Recreation | $352,800 | $317,500 | $282,200 |
| Food Services and Drinking Places | $351,000 | $315,900 | $280,800 |
| Repair and Maintenance | $228,800 | $205,900 | $183,100 |
| Personal and Laundry Services | $86,000 | $77,400 | $68,800 |
| Religious, Grantmaking, Civic, Professional, and Similar Organizations | $160,600 | $144,600 | $128,500 |
| Total | $6,504,900 | $5,854,300 | $5,203,600 |

*Source: Development Research Partners.*
*Note: Direct economic benefits differ from the above totals as a result of leakage through retail trade and payments for housing. Please see Table 10.*

- Based on the basket of goods and services subject to retail sales tax in the City and County of Denver and spending patterns derived from the U.S. Bureau of Labor Statistics, Consumer Expenditure Survey, about 30 percent of DSF recipient income will be spent on taxable goods and services.[9]
- Under the 100 percent scenario, of the $8 million in additional earnings by DSF recipients, about $2.4 million will be spent on taxable goods and services.
- However, some of this potentially taxable spending is spent in communities outside of the City and County of Denver. A retail leakage analysis based on Colorado Department of Revenue data for retail sales per capita indicates that Denver will capture about 77 percent of household purchases of taxable goods and services. As a result, the additional taxable spending in Denver totals $1.8 million per year.
- The additional taxable spending in Denver is slightly lower in the 90 percent scenario, dropping to $1.7 million. Under the 80 percent scenario, the value drops to $1.5 million.
- Based on these assumptions and the Denver sales tax rate of 3.62 percent (4.0 percent for food and beverages purchased in bars and restaurants), the additional annual spending in Denver by each

[9] Contrary to some other communities in the Denver region, the City and County of Denver does not tax food for home consumption. Denver does tax gas and electricity for residential use.

cohort of 520 DSF recipients will generate an estimated $64,300 in retail sales tax revenue each year for the City and County of Denver, under the 100 percent scenario.

## Sales Tax Benefit over 10 Years of DSF Recipients

- The additional annual spending in Denver by each cohort of 520 DSF recipients will generate an estimated $64,300 in retail sales tax revenue each year for the City and County of Denver. As more graduates enter the workforce and contribute to the economy of the region, sales tax benefits will grow proportionally each year. Over 10 years, the benefits could total about $3.5 million assuming similar enrollments, persistence rates, and economic conditions. The impact will continue to grow in proportion to the number of DSF recipients who persist through a postsecondary education and engage in the labor market.
- Estimated sales tax revenue for the 90 percent scenario is $57,900 each year, totaling $3.2 million after 10 years of enrollments and graduates. For the 80 percent scenario, annual tax revenue is $53,300 with an estimated $2.9 million after 10 years.

**Table 12: Annual City and County of Denver Sales Tax Revenue Attributable to DSF Recipients**

| Percent Denver Residents | Annual | 10-Year Cumulative Benefit |
|---|---|---|
| 100% | $64,340 | $3,538,580 |
| 90% | $57,910 | $3,184,780 |
| 80% | $53,330 | $2,932,930 |

*Source: Development Research Partners.*

# Chapter 6: Summary

As this study illustrates, the Denver Scholarship Foundation's efforts have great benefit both to the life chances of the individual graduates and to the economic future of the Denver region. Colorado faces a number of persistent education challenges. The state ranks in the top five for the number of degree holders per capita but only one in four current Colorado ninth graders will go on to earn a degree. In Denver, for every 100 ninth graders, 60 graduate high school four years later, 46 immediately enter college, 19 are still enrolled in their second year, and only eight earn an associate or bachelor's degree in six years.

The Denver Scholarship Foundation plays an important role in increasing postsecondary aspirations and access for DPS students. Since 2006, DPS has experienced an increase of 14.5 percentage points in the number of students either retained in college or completing a postsecondary credential. The number of DPS students pursuing college immediately after graduation has increased by 30 percent. The DPS male graduation rate rose from 33 percent in 2007 to 57 percent in 2014. DPS leadership attributes the district's improved performance to three factors: higher expectations, personal attention from staff, and the Denver Scholarship Foundation, which holds the promise of financial aid for graduates who move on to college.

The return on investment for DSF scholarship recipients is impressive. The average DSF investment in a DSF graduate returned $9.59 for every $1.00 in scholarship in taxes paid. When you consider alternative life paths for individuals who don't attend college, it puts the investment in support for college attendance in context. For example, the ANNUAL cost for incarceration for an inmate in Colorado is 2.3 times higher than the TOTAL average award for a DSF graduate.

If DSF achieves its goal of 520 new recipients each year, with an 85 percent persistence rate, the program will help 442 students earn certificates or degrees each year. The 520 DSF recipients mean greater economic benefits to the Denver region. If 100 percent of the recipients return to or remain in Denver, the benefits include:

- Of the 520 DSF recipients, only 26 are likely to be unemployed, which is 13 less than if the DSF recipients had only achieved a high school diploma.
- Due to lower unemployment and higher paying career opportunities, the DSF recipients will have $8 million more in annual earnings (compared with a high school diploma).
- Of the $8 million in higher annual earnings, about $6.5 million more will be spent in the Denver region (after savings and leakage).
- The $6.5 million in additional annual spending in the Denver region ripples throughout the economy, resulting in an $8.1 million annual increase in the value of total output in the Denver region when multiplier effects are considered.
- An additional 66 direct and indirect workers will need to be employed throughout the Denver region in order to accommodate the $8.1 million increase in output.
- The 66 additional workers will earn about $2.4 million annually in salary and wages.
- Spending by the 520 DSF recipients will generate $64,300 in additional annual retail sales tax revenue for the City and County of Denver.

The 80 and 90 percent scenarios result in slightly lower benefits, as detailed in Table 13.

In light of these clear benefits, it is important to place in context recent changes to DSF scholarship offerings. Fiscal constraints at DSF have led to a reduction in the number of students who can receive DSF's crucial college access services and financial support for college attendance. Now, more than ever,

it is important for continued investment in organizations like DSF whose support has such a strong impact on the most vulnerable high school graduates.

**Table 13: Summary of Annual Economic Benefits of DSF Recipients**

| | 100% | 90% | 80% |
|---|---|---|---|
| DSF Recipient Additional Earnings | $8,031,800 | $7,228,700 | $6,656,900 |
| DSF Recipient Annual Spending | $6,505,000 | $5,854,000 | $5,204,000 |
| Multiplier Impacts (Metro Denver) | | | |
| Value of Total Output | $8,115,000 | $7,303,000 | $6,491,000 |
| Direct & Indirect Earnings | $2,396,000 | $2,156,000 | $1,917,000 |
| Direct & Indirect Employment | 66 | 60 | 53 |
| Fiscal Impact (City and County of Denver) | | | |
| Sales Tax Revenue | $64,340 | $57,910 | $53,330 |

# Appendix A: 76 Percent Persistence

The analysis contained in the main body of this report is forward-looking, presenting the potential benefits of the Denver Scholarship Foundation program if it achieves its goal of 85 percent of its scholarship recipients persisting in postsecondary education to earn a degree or certificate. This appendix presents the results of the analysis based on the program's current persistence rate.

## 76 Percent Persistence Rate

A higher percentage of DSF recipients that complete college will result in higher expected economic benefits through better occupational outcomes and earnings potential. A lower persistence rate will increase the number of recipients that have completed some college, but have not earned a degree or certificate. These individuals will have higher unemployment rates and will cluster in occupations with lower earnings and fewer educational requirements. The effect of a lower persistence rate is a decrease in economic benefits.

**Table 14: Summary of Annual Economic Benefits of DSF Recipients, 76 Percent Persistence Rate**

| | 100% | 90% | 80% |
|---|---|---|---|
| DSF Recipient Additional Earnings | $7,191,300 | $6,472,200 | $5,960,000 |
| DSF Recipient Annual Spending | $5,824,000 | $5,242,000 | $4,659,000 |
| Multiplier Impacts (Metro Denver) | | | |
| Value of Total Output | $7,265,000 | $6,539,000 | $5,812,000 |
| Direct & Indirect Earnings | $2,145,000 | $1,931,000 | $1,716,000 |
| Direct & Indirect Employment | 60 | 53 | 47 |
| Fiscal Impact (City and County of Denver) | | | |
| Sales Tax Revenue | $57,610 | $51,850 | $47,740 |

# Appendix B: Underlying Assumptions

This study estimates occupational outcomes and measures economic impacts based on an annual number of DSF recipients. This framework simplifies the complex task of quantifying benefits for a point-in-time estimate that would involve numerous assumptions including economic conditions, years of schooling, work experience, and the compounding benefits of DSF graduates over time.

Economic impacts for this study rely on potential earnings for DSF recipients. The underlying assumption behind the numbers is that DSF recipients would have only completed high school had they not received scholarship funding. In addition, the study assumes that occupational outcomes and earning power would resemble the average high school graduate based on national and regional data sources. In reality, some DSF recipients would likely have attended and completed college despite the program. This study does not attempt to analyze the effectiveness or composition of DSF's programs. Rather, this study demonstrates the potential economic benefits of the program under a reasonable set of assumptions.

Other sources of economic impact beside potential earnings were considered for the study. However, the most reasonable and reliable estimate is based on earnings. Other potential areas of economic impact include the effect of DSF on university spending, the impact of DSF spending on its own business purchases and spending, and the impact of student spending during college years. These impacts are likely small or negligible. DSF notes that for every dollar contributed to students through the program, partner colleges match $2 of institutional support. The net result is little if any benefit as increased revenue for the school is offset by scholarships and cost of services.

DSF has operated as an organization since 2006 and as such makes business purchases and hires employees. While DSF's operations likely benefit the region, it is hard to say whether its operations represent a net increase in economic activity in the Denver region. Many of DSF's supporters are local businesses, individuals, and philanthropic organizations. The support provided by these individuals and companies may come at the expense of other business purchases or investments. DSF is also a nonprofit organization and likely has a fiscal cost to the City and County of Denver as it consumes services without paying taxes.

Lastly, student spending during their educational experience is a net positive and economic driver for many communities. However, these benefits accrue from students that are imported into the community from other regions. Since this study is of the benefits to the Denver region, most of the student spending is not an added benefit. DSF recipients are required to apply for other scholarships that may come from donors and organizations from outside of the Denver region; thereby boosting the region's output. However, any added benefit is likely negated because students have an opportunity cost while attending college from the money they could have earned and spent had they worked instead. Further, if students do not complete college, their overall impact may likely be negative if they end up earning wages that are no better than if they had not attended school.

# References


About Colorado. (2014, August 1). Retrieved October 18, 2014, from https://www.teachforamerica.org/where-we-work/colorado

ACT, Inc. 2014. The Condition of College and Career Readiness Report. http://www.act.org/research/policymakers/cccr14

Alliance for Excellent Education. 2013. Saving Futures, Saving Dollars: The Impact of Education on Crime Reduction and Earnings. http://all4ed.org/wp-content/uploads/2013/09/SavingFutures.pdf

Arapahoe/Douglas Works! 2014. Competitive Wage Intelligence, Occupational Saturation Tables. http://www.adworks.org/index.php/businesses/workforce-intelligence-trends/competitive-wage-intelligence

Baum, S., J. Ma, and K. Payea. 2013. Education Pays 2013: The benefits of higher education for individuals and society. Washington DC College Board. http://trends.collegeboard.org/sites/default/files/education-pays-2013-full-report.pdf

Buckley, P. and L. Muraskin. 2009. Graduates of Denver Public Schools: College Access and Success.

Castleman, B. L. and B. T. Long. 2012. Looking beyond enrollment: The causal effect of need-based grants on college access, persistence, and graduation. http://gseacademic.harvard.edu/~longbr/Castleman_Long_-_Looking_Beyond_Enrollment_-_draft_Oct2012.pdf

Colorado Department of Education, Colorado Education Statistics. http://www.cde.state.co.us/cdereval

Colorado Department of Labor and Employment. Labor Market Information. Long-Term Industry Employment Projections, 2013-2023. http://www.colmigateway.com

Colorado Department of Local Affairs. State Demography Office. Population Estimates. www.dola.colorado.gov.

Colorado Department of Revenue. Retail sales data, 2012.

Compton, Janice and Robert A. Pollak. 2009. "Proximity and Coresidence of Adult Children and their Parents: Description and Correlates." University of Michigan.

Cornwell, C., Mustard, D. B., & Sridhar, D. J. (2006). The enrollment effects of merit-based financial aid. Journal of Labor Economics, 24, 761–786.

Deming, D. and S. Dynarski. 2009. Into college, out of poverty? Policies to increase the postsecondary attainment of the poor. Cambridge, MA: National Bureau of Economic Research. http://www.nber.org/papers/w15387.pdf?new_window=1

Denver Post. 2014. *Graduation rates up in Colorado; South High leads Denver school gains.*

Denver Scholarship Foundation. www.denverscholarship.org

# References


Glaze, L. E. 2011. Correctional Populations in the United States. Washington, DC: U.S. Department of Justice, Bureau of Justice Statistics. http://www.bjs.gov/content/pub/pdf/cpus10.pdf

Heller, D. E. 2006. Merit aid and college access. Madison, WI: Wisconsin Center for the Advancement of Postsecondary Education. http://php.scripts.psu.edu/deh29/papers/WISCAPE_2006_paper.pdf

Heller, D. E. and C. J. Rasmussen. 2001. Do merit scholarships promote college access?: Evidence from two states. Ann Arbor, MI: Center for the Study of Higher and Postsecondary Education. http://edwp.educ.msu.edu/dean/wp-content/uploads/2012/03/ashe_merit01.pdf

Levin, H.M. and McEwan, P.J., eds, 2002. Cost-effectiveness and educational policy: 2002 yearbook of the American Education Finance Association. Larchmont,NY:Eye on Education.

Levin, H., C. Belfield, P. Muenning, and C. Rouse. 2006. The Costs and Benefits of an Excellent Education for All of America's Children. New York: Columbia University, Teachers College, Center for Benefit-Cost Studies on Education. http://www3.nd.edu/~jwarlick/documents/Levin_Belfield_Muennig_Rouse.pdf

Metro Denver Economic Development Corp. 2014. *Toward a More Competitive Colorado*. http://www.metrodenver.org/research-reports/toward-a-more-competitive-colorado

National Center for Higher Education Management Systems, 2011. Colorado Higher Education Financing Study" https://www.cu.edu/news/releases/nchem/CCHE-ExecSum-FinancingStudy.pdf

National Institute of Corrections 2011. Cost Containment in Corrections. http://nicic.gov/costcontainment

Ramsey, B., J. Rexhausen, A. Dubey, and L. Yu. 2008. An Evaluation of the Economic Benefits of High School Education. Cincinnati, PH: University of Cincinnati, Economics Center for Education & Research. http://www.oapcs.org/files/benefitsofhsdiplomafinaljan2009.pdf

Tiffany, Julian. 2012. "Work-Life Earnings by Field of Degree and Occupation for People with a Bachelor's Degree: 2011." U.S. Census Bureau, American Community Survey Brief, October.

Tinto, V. 2004. Student retention and graduation: Facing the truth, living with the consequences. Washington, D.C.: The Pell Institute. http://www.pellinstitute.org/downloads/publications-Student_Retention_and_Graduation_July_2004.pdf

U.S. Department of Commerce, Bureau of the Census. 2013. American Community Survey. Public Use Microdata Sample (PUMS). http://www.census.gov/acs/www/data_documentation/public_use_microdata_sample

U.S. Department of Commerce, Bureau of Economic Analysis. Regional Input-Output Modeling System II Multipliers, 2002 Annual Input-Output Table for the Nation and 2010 regional data.

U.S. Department of Commerce, Bureau of Labor Statistics. Employment Projections, Earnings and Unemployment Rates by Educational Attainment, March 2014. http://www.bls.gov/emp/ep_chart_001.htm

# References


U.S. Department of Commerce, Bureau of Labor Statistics. National Compensation Survey, "Employer Costs for Employee Compensation," December 2014. http://www.bls.gov/ncs/

U.S. Department of Commerce, Bureau of Labor Statistics. Occupational Employment Statistics, May 2013. http://www.bls.gov/oes

U.S. Department of Education, National Center for Education Statistics. Classification of Instructional Programs (CIP), 2010. http://nces.ed.gov/ipeds/cipcode/

U.S. Department of Education, National Center for Education Statistics. Integrated Postsecondary Education Data System (IPEDS), 2013. http://nces.ed.gov/ipeds

U.S. Department of Education, National Center for Education Statistics. 2013. "Residence and Migration of all First-Time Degree/Certificate-Seeking Undergraduates in Degree-Granting Postsecondary Institutions who Graduated from High School in the Previous 12 Months, by State or Jurisdiction: Fall 2012." *Digest of Education Statistics*. http://nces.ed.gov/programs/digest/2013 menu_tables.asp

U.S. Department of Justice, Bureau of Justice Statistics and Federal Bureau of Prisons. 2003. Survey of Inmates in State and Federal Correctional Facilities. Ann Arbor, MI: Inter-University Consortium for Political and Social Research.

Williams A. & Swail, S. (2005). Is more better? The impact of postsecondary education on the economic and social well being of American society. Educational Policy Institute. http://www.educationalpolicy.org/pdf/gates.pdf.

Young, F. D., Jones, R., & Sampson, M. (2006). Correctional populations of the United States, 2003. (Report No. ACRL223312). Retrieved from Bureau of Justice Statistics: http://www.bjs.gov /pubs2006/2006ACRL223312.pdf