



Applied Research Collaborative

UNLV Office of Economic Development
UNLV Center for Business Research

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Semi-Annual Progress Report

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Table of Contents

Project Purpose	3
Project Status/Major Accomplishments	7
Commercialization and Partnering with Industry	10
Grants and Outside Funding	10
Intellectual Property	11
Programmatic and Project Changes	11
Looking Forward	11
Performance Metrics	12
Budget	13

Project Purpose

The UNLV Applied Research Collaborative (ARC) will be housed at the Lee School of Business' Center for Business and Economic Research (CBER), with support facilities and activities at Black Fire Innovation and the UNLV Incubator. This support will provide dedicated funding to the applied research mission that has proven so successful at our sister institution, UNR, with its Nevada Center for Advanced Research (NCAR). In that spirit, this new UNLV program will result in business research coverage of the entire state via a number of services that enhance the competitiveness of Nevada's businesses – and help attract new ones - by supporting and improving the environment for interdisciplinary collaboration private and public entities. . To achieve these outcomes, this initiative will:

- Establish collaborative relationships between academic and business leaders to promote innovation, research programs, and startups to address real-world and marketplace problems.
- Produce a strategic plan that will help foster further public private research opportunities between academia, private industry, and venture capital to test and commercialize brand new technologies and companies in prioritized disciplines.
- Connect industry partners with governmental agencies to promote pilot programs, research initiatives, and other collaborations.
- Facilitate access to cutting-edge research labs, incubators, and accelerators across Southern Nevada in a way that develops and diversifies the economy while providing students and faculty with real-world access to data, expertise, and startup support.
- Build interdisciplinary teams of faculty, scientists, postdoctoral students, and grad students to solve industry problems, including those in priority science areas.
- Provide access to an innovation ecosystem that includes incubation, acceleration, and business mentoring at the UNLV Incubator, UNLV's Black Fire Innovation accelerator, Troesch Center for Innovation and Entrepreneurship, the Small Business Development Center (SBDC), the UNLV School of Engineering, and the UNLV School of Medicine.
- Provide co-working space for Nevada's university communities and local startups, leveraging world-class facilities including the \$35M Harry Reid Research and Technology Park facilities, identify needs in terms of space or equipment, or other facilities in the community.

UNLV Research and Relevant Business Resources

If we consider UNLV's "birth date" of 1969, when it was launched as an autonomous university, UNLV's research expertise has grown at an impressive rate. In fact, UNLV was the first university in American history to achieve Carnegie's top "Research 1" (R1) designation in less than 50 years. Today, UNLV boasts expertise in a number of core R&D disciplines. To focus in on the UNLV expertise that foster and build collaborations in the sciences we will prioritize the following "**core disciplines:**"

- New Generation Hospitality and Tourism Services and Solutions
- Advanced Manufacturing
- Sports Research and Innovation Services and Solutions
- Energy and Superconducting Services and Solutions
- Fine Arts, Film, and Entertainment
- Transportation, Mobility, and Logistics
- Cybersecurity and information systems
- Health Care and Expanding Clinical Enterprises

In the next sections, we describe some of the resources available to businesses seeking research and advising in these and related fields. These programs will be marketed and introduced, via industry-facing bimonthly events hosted at Black Fire Innovation, the UNLV Incubator, on campus, and at the Lee School of Business.

UNLV School of Medicine and Academic Health Sciences

The newly established UNLV School of Medicine is rapidly growing and healthcare has been one of the fastest growing industries in Southern Nevada for decades. The need for healthcare does not stop just at the need for more doctors, but also for more clinical research, new technologies, and even space for biotechnology research. This also relates to workforce where there is no clinical laboratory training program in Southern Nevada as well as dedicate space for biotechnology research such as for the UNLV Institute for Personalized Medicine. CBER forecasts that the size of the healthcare industry (GDP) in Southern Nevada alone will nearly triple in the next 40 years requiring at least an additional 85,100 workers. The return on investment in healthcare and research is for every one job in the industry there are 3.57 support jobs, \$1 of investment equals \$1.20 in broader economic activity, and 40% of the professions in life sciences do not require a Bachelor's degree.

Hospitality and Tourism: Harrah College of Hospitality (HCH) and International Gaming Institute (IGI)

The Harrah College of Hospitality has been recognized as the nation's #1-ranked hospitality program, covering the range of fields that serve our state's largest industry. The secret to its success is its industry-facing, immersive, hands-on teaching and research approach – virtually all faculty all have major industry experience, and students are required to have 1,000 hours of industry experiences. The college is located inside the jewel of the UNLV campus—Hospitality Hall, located just blocks away from the famed Las Vegas Strip. Our close connection to the industry and responsiveness to the needs of the evolving hospitality market help us maintain our top position among competing programs—producing graduates who are leading all major sectors of the industry across the globe.

Seed funded by the Knowledge Fund in 2013, the UNLV International Gaming Institute (IGI) has become one of the state's highest-producing innovation labs as measured by all-important metrics of US patents issued and commercialized IP. Now the largest R&D institute at UNLV, the IGI and its 51-person team engages governments on six continents and dozens of countries each year, and boasts funded research projects on new jurisdiction development (including major urban development work for companies like MGM, Wynn, Las Vegas Sands, and Caesars), technology innovation, responsible gaming, sustainability, and diversity and inclusion. Over the past eight years, the IGI has partnered with virtually every major gaming and hospitality technology, operations, and entertainment company in the state and around the world.

Sports Research and Innovation Initiative (SRII)

Seed funded by the Knowledge Fund in 2019, the UNLV Sports Research and Innovation Initiative (SRII) boasts partnerships and/or projects with every major sports organization in the state, including the Las Vegas Raiders, the Las Vegas Aces, the Vegas Golden Knights, and the UFC. The SRII provides a research and development infrastructure for more than 100 researchers on the UNLV campus focusing on sports, in fields as diverse as business and marketing, Paralympic technology, kinesiology, engineering, sports medicine, and sports betting. The program's "pillars of excellence" include work on brain health, sports medicine, diversity and inclusion in sport, military and first responder health and performance, and sports psychology, performance, technology, and business. The SRII's recently-announced partnership with UNR's Sports Management program ensures alignment across the state, as UNR provides certificate programs and UNLV provides masters' degrees and affiliated research.

Energy: Nevada Extreme Conditions Laboratory (NEXCL)

In 2020, UNLV physicist Ashkan Salamat achieved a "holy grail" of science, recognized with a *Nature* cover story and global media attention (including being named a *TIME* magazine "Top 100 Next" achievement, a *Physics World* Top Breakthrough of 2020, and recognition in the *New York Times*, *BBC*, and virtually every major news media outlet). The achievement: room-temperature superconductivity, which potentially transforms every device we touch, from a

telephone to a rocket ship, by allowing energy to move across distances without any heat or energy loss. Highlighted as perhaps the most innovative discovery in the history of Nevada by Governor Sisolak and the Nevada State Legislature, we are at the leading edge of a shift from a semiconducting world to a superconducting one, led by a team of internationally-recognized expert researchers and administrative staff to manage our initiatives. The Nevada Extreme Conditions Laboratory (NEXCL) will be a multidisciplinary center tackling the toughest questions pertaining to the future of energy, potentially transforming the state into a global energy hub.

Fine Arts, Film, and Entertainment: UNLV College of Fine Arts

As both UNLV and GOED work together to attract top film studios and related new businesses to the region, the UNLV College of Fine Arts and Dean Nancy Uscher have become invaluable champions of workforce development for this growing sector. At present, the college's programs in entertainment engineering, film, design, and theater are producing a workforce to support these industries, and are working on confidential initiatives to bring multiple film studios to Nevada. This ARC initiative will link this college's expertise with the UNLV Office of Economic Development for the first time, as its faculty has the expertise to provide advising and research services to this vital industry. This will include new arts and entertainment technology that needs testing and collaborative facilities.

Transportation, Mobility, and Logistics: UNLV Transportation and Research Center

The UNLV College of Engineering's Transportation and Research Center serves as a focal point at UNLV to facilitate multi-disciplinary initiatives by bringing together assets and resources from across UNLV, and developing partnerships with public and private sector entities and not-for-profit organizations. This included leveraging the expertise and experience at various organized research units and centers and academic program across UNLV. The collective expertise and initiatives facilitated by TRC include topics across the transportation system life cycle (policy, planning, design, construction, operations, maintenance, rehabilitation, and management) and across various transportation modes. The UNLV School of Engineering has applied for a grant for a Center for Battery Excellence. The lithium-ion battery industry is forecasted to expand 5-fold in the next 10 years and Nevada is in a prime position to grow and bring more battery companies to our state which will require workforce partnerships, industrial testing facilities, and exchange of industry knowledge.

To date, faculty members, research staff, undergraduate and graduate students have successfully worked on more than one hundred and fifty basic and applied research projects. These projects have supported a wide range of sponsors including several federal, state and local government agencies as well as from the private sector. TRC's initiatives aim to build on these activities and create new opportunities for cross-disciplinary transportation research, scholarship, innovation, and creative activities and outreach initiatives to enhance the quality of living of individuals and families; improve the experience of visitors; increase the economic competitiveness/ vibrancy of public, private, and not-for-profit organizations, and expand the prosperity of communities.

Cybersecurity and Small Business Development: UNLV Cybersecurity Center

UNLV's Cybersecurity Center program has been designated as a National Center of Academic Excellence in Cyber Defense Education (CAE-CDE). Sponsored jointly by the National Security Administration (NSA) and the Department of Homeland Security (DHS), the goal of the program is to reduce vulnerability in our national information infrastructure by promoting higher education and research in cyber defense. UNLV received the designation for its IA program. Working with UNLV's Small Business Development Center, this center of excellence is seeking seed funding to support a free clinic for small businesses that are threatened by cyber-attacks but lack the IT expertise or personnel to protect themselves.

Project Status/Major Accomplishments

1. Via its Knowledge Fund-driven partnership with Rainmaking.io/Aspire, the UNLV Incubator powered by Hughes launched its first faculty and staff entrepreneur cohort. The program was designed over a two day period in August 2022 onsite at the UNLV Incubator facility. Representatives from Rainmaking/Aspire worked with Dr. Robert Rippee to develop the eight-week program. Information about the upcoming cohort was distributed through OED, Office of the Vice President of Research, Desert Research Institute, The College of Engineering, The School of Architecture, The Sports Research and Innovation Initiative and specific entrepreneurial faculty. The goal was to obtain interest from 10 faculty for this first-time program. Inquiries and requests to enroll were received from twenty-one faculty members representing engineering, sciences, nursing, fine arts, SRII, and DRI. Given the unexpectedly high level of inquiry and interest, Aspire and the UNLV Incubator decided to operate dual cohorts instead of a single, and to stagger them by approximately two weeks. The first cohort launched on September 26. The Second cohort will launch on October 17. The first cohort is composed of faculty with specific ideas for commercialization while the second is composed of faculty who are responsible for programs where innovation can occur. The program is based on two important components of the commercialization process: market assessment and customer discovery. The modules provided by Rainmaking/Aspire are primarily on-demand supplemented with a weekly workshop and team venture coaching sessions. In addition the UNLV Incubator host two on-site workshops on Regulatory/NSHE Requirements and Intellectual Property.
 - a. Core disciplines supported: all
2. Since opening in November 2021, the UNLV Incubator has overseen five cohorts. The first three cohorts drew 18 early-stage startups in range of diverse industries from hospitality and gaming to food security, wellness, fine art, and mobile applications. The two most recent cohorts are the faculty cohorts as mentioned.
 - a. Core disciplines supported: all
3. In September 2022, filled the Knowledge Fund-supported Black Fire Innovation building with a "unicorn floor," featuring the opening of a global

HQ for Sightline Payments, [Southern Nevada's first-ever fintech unicorn](#). Funded in part by Vegas Golden Knights owner Bill Foley (a longtime Fidelity executive focused on the fintech space), Sightline is leading societal and consumer shifts to a cashless economy. In addition, a second

- a. Core disciplines supported: New Generation Hospitality, Entertainment, Tourism, and Gaming Services and Solutions; Sports Research and Innovation Services and Solutions
4. Also opened a Black Fire HQ for Geocomply in September 2022. Geocomply is a cybersecurity and geofencing technology company whose fortunes have risen dramatically with the technology needs of companies (such as Netflix) that require geofencing technology to determine subscription rates and/or policy implications. Geocomply is a partner of UNLV in our tech and innovation programming, as well as our "Women in Tech" initiatives led by former UNLV president Marta Meana and former Mayor of Las Vegas Jan Jones Blackhurst (Geocomply's CEO is Anna Sainsbury).
 - a. Core disciplines supported: all
 5. Brought Southern Nevada's only other tech unicorn, Switch Communications, to Black Fire – which means that this \$35M Knowledge Fund-supported facility now features collaborations with all three tech unicorns in the valley. This was accomplished by winning a \$600,000 Clark County grant to build a dark fiber line connecting Switch to the Tech Park, in a development that will supercharge the Park's big data capacities by linking our tech businesses to the supercomputer housed at Switch (Cherry Creek).
 - a. Core disciplines supported: all
 6. Hosted in March, 2022, a successful Sports Summit in partnership with corporate partner UFC, a multi-billion-dollar global leader in sports entertainment headquartered in Las Vegas – now a full partner in our Sports Research and Innovation initiative (see separate Knowledge Fund report on this entity).
 - a. Core disciplines supported: Sports Research and Innovation Services and Solutions
 7. Broke ground on first standalone "big tech" facility, with [T-Mobile](#), to partner with UNLV programs in telecommunications, 5G and 6G technology, engineering, computer science, and women-in-tech innovation, becoming our first "marquee building" at the UNLV Tech Park.
 - a. Core disciplines supported: all
 8. Won \$2.1M EDA grant in support of opening a brand new "Black Fire in the Historic West Side" of Las Vegas, with support of Congressman Horsford and Senator Cortez Masto. This facility will open in the next reporting period, and will focus on tourism startup and small businesses, especially those that qualify as Disadvantaged Business Enterprises. This project will also support three economic development plans, authored by UNLV, to diversify the tourism industry further into medical tourism, sports tourism, and cultural-arts tourism sectors.
 - a. Core disciplines supported: all
 9. Worked with Clark County on a new "Southern Nevada Tech District," a first-ever initiative to be anchored by corporate partner [Switch Communications](#) and the UNLV Harry Reid Research and Technology Park. To this end, the facility held dozens of events with corporate and government partners, including an August 15th "Night with the President," showcasing in front of

legislative and elected officials the capacities of our new tech building. Other corporate events: Google, US Soccer (hosts of the 2026 World Cup), and the NFL (during the Pro Bowl week in February).

- a. Core disciplines supported: all
10. Secured support for a \$3.3M earmark from Congresswoman Susie Lee's office in support of our Sports Research and Innovation Initiative, bringing total federal dollars in grant this reporting period to over \$5.4M.
 - a. Core disciplines supported: all
11. Hosted five "[Brews and Economic Views](#)" public events which were attended by over 250 individuals on topics ranging from biotechnology to water tech, the lithium-ion battery and sports economy.
 - a. Core disciplines supported: all
12. CBER built partnerships in a variety of industries with the goal of advancing collaborations between the University and private sector in several emerging economic sectors: healthcare, manufacturing, clean energy economy, esports, medical tourism, cannabis, arts and entertainment.
 - a. Core disciplines supported: all
13. Expanded CBER and ARC support team by 7 (Program Manager, 3 undergraduate researchers, and 3 faculty researchers) in the past 6 months with further positions (AVP of Innovation and Partnerships, Director of Commercialization, Director of Communications, Director of Events, Project Manager, Faculty Expert, and three Graduate Assistants) forthcoming.
 - a. Core disciplines supported: all
14. During this time period, added new startups to Black Fire, and now boast nearly 100 companies in the UNLV Tech Park overall. In total, these companies are worth more than \$3.2 trillion – and many of these entities lacked a Nevada footprint before these facilities opened.
 - a. Core disciplines supported: all
15. Acquired \$30M Briova Building, adjacent to existing Black Fire Innovation Building at the Tech Park, for future biomedical, clinical, and lab space dedicated to innovation and entrepreneurship. This effort represents a major financial commitment from the university in support of innovation and entrepreneurship – the largest single I&E investment in the university's history. It is supported by the Office of the President and the UNLV Kerkorian School of Medicine, and launches a ground-breaking effort in support of the School of Medicine's efforts to build its R&D capacity in a way that did not exist before in the Las Vegas valley.
 - a. Core disciplines supported: all
16. Led UNLV's submission for the National Science Foundation's Economic Engines Type 1 \$1 million-dollar planning grant for a Clean Energy Ecosystem Center of Excellence (CEEEOE) which will serve as a one-stop shop for lithium and hydrogen. In the process we built partnerships and received support from 10 different industry partners who will support the CEEEOE in its work. If selected NSF will provide \$1 million dollars in planning grant funds and applicants will be offered to submit for a Type 2 grant which is worth \$160 million over 10 years. ARC committed staff time (20%) to help run the Center if our proposal is selected.
 - a. Core disciplines supported: energy
17. Hired new AVP of Technology and Partnerships, Zach Miles, who returns to UNLV to lead UNLV efforts to assess, manage, and protect IP partnerships

with tech companies in Las Vegas. This was done in support of the ARC initiative, but without Knowledge Fund dollars, representing UNLV's continuing commitment to supporting these projects with UNLV funds.

- a. Core disciplines supported: all
18. Hired new Director of Communications (Doug Puppel, formerly of Las Vegas Review Journal and NPR), supported by Knowledge Fund monies, to communicate to community the capacities of UNLV to build tech partnerships supported by UNLV R&D resources.
 - a. Core disciplines supported: all
19. Led UNLV's submission for the NSF Economic Engines Type 1 \$1 planning grant for an I-15 Tech Corridor in partnership with the new Utah Tech University (St. George) focused on sustainability technology development partnerships at the two universities.
 - a. Core disciplines supported: energy
20. Provided expertise and served as a nexus between UNLV, City of Las Vegas, state legislators, and industry representatives in the biotech industry to expand Southern Nevada's footprint in bio health research, development, and manufacturing around facilities and partnerships.
 - a. Core disciplines supported: healthcare
21. Spearheaded ongoing planning efforts between academia, government, and industry on The CHIPS and Science Act (CHIPS) as well as all the Inflation Reduction Act (IRA) with the goal of prioritizing partnerships between academia and industry in research, development, and workforce disciplines that are likely to receive federal funding through a competitive grant process as a result of the legislation.
 - a. Core disciplines supported: energy and advanced manufacturing
22. \$50,000 of ARC's UNLV Commercialization fund, was allocated to the [President's Innovation Challenge](#) (PIC) to support the top 3 winning teams. 2022 marked the inaugural year for the PIC -- a team competition open to undergraduate and graduate students at UNLV, to encourage social and business entrepreneurship that helps solve major problems of in Southern Nevada. The challenge was spearheaded by UNLV's Office of the President, Graduate College, and the Office of Economic Development. The event was an overall success and it is anticipated to flourish in coming years.

Commercialization and Partnering with Industry

See above items 1, 3, 4, 5, 6, 7, 9, 11, 12, 14, 15, 16, 17, 20, 21, 22, and 23 for descriptions.

Grants and Outside Funding

Secured outside funding for interdisciplinary research that translates back to knowledge fund priorities with engineering, economics, and hospitality on topics such as battery technology, complete streets, responsible gaming, and economic education in public schools. Projects include:

Name of Project	Amount	Interdisciplinary Partner	Funder
Southern Nevada Industrial Land Study	\$205,000	Public Policy and Engineering	Governor’s Office of Economic Development
EDA Build Back Better Travel, Tourism and Outdoor Recreation (see Item 7 above)	\$2.1M	UNLV Harrah College of Hospitality, Kerkorian School of Meidcine	EDA
Sports Research and Innovation Institute	\$3.3M	UNLV School of Health Sciences, UNLV School of Business, UNLV Harrah College of Hospitality, UNLV College of Education	Congresswoman Susie Lee’s office

Intellectual Property

For intellectual property projects in support of core discipline “New Generation Hospitality, Entertainment, Tourism, and Gaming Services and Solutions,” see report filed on “Global Gaming Capital Initiative” Knowledge Fund project (UNLV International Gaming Institute). The IGI’s innovation initiatives provided the foundation for the relationship with Caesars, our founding corporate partner at the Tech Park, and now the Tech Park provides an unrivaled showcase capacity for university intellectual property not previously possible UNLV campus facilities – in a manner that supports our intellectual property efforts.

Programmatic and Project Changes

Since the previous report, we have discussed modifications to staffing, budget, and other programmatic changes. Some of these changes have been noted in the first portion of this report. The changes will be detailed out in a formal request to GOED for review and decision the firs week of October 2022.

Looking Forward

In our next report, we will announce grand openings at our new Briova Building, and major announcements in two new buildings we believe will be secured and developed. We also will provide updates on the new funding proposals outlined above. In addition, the next report will highlight the further filling out of our team, as the ARC funding has helped support efforts to more than double the innovation and entrepreneurship workforce at UNLV.

Performance Metrics

As the project evolves, we provide suggested performance metrics for future reports below:

- Research Grants Applied For (\$/#)**
- Research Grants Received (\$/#)**
- SBIR/STTR Grants Applied/Received (#/\$) (related to SAGE)**
- Gifts/Donations (\$)**
- Commercial Sponsored Research \$**
 - # of new engagements (thinking just company contacts, not formal agreements. Can list names or just a count)**
 - # of commercial partners**
 - # Startups Generated (from Incubator or other)**
 - # of student cohorts supported**
 - # of student cohorts “graduated”**
 - # of students participating in incubator program**
 - # of prototypes developed (incubator)**
 - # of coaching or mentoring hours provided to cohorts**
- # of Patents Filed**
- # of Patents Issued**
- # of License Agreements executed**
- \$ Commercialization Revenue**
 - # of Companies locating to Park (either physical presence or other)**
 - # of Companies locating to NV**
 - \$ Revenue generated by those businesses**
 - # of jobs/created/saved (outside UNLV)**
 - # of events or workshops hosted**
 - Sq footage of newly developed facilities (labs or new buildings at park)**
 - # of new tenants signed, or list the names**
- Faculty Hired or Retained (#)**
- Students Hired/Retained (#)**

Budget

Company: University of Nevada, Las Vegas

Period: FY 2023 - 02 August

Worktags: Grant: GR14240 UNLV Applied Research Collaborative (ARC)

Ledger Account Summary	Original Budget	Budget Amendments	Current Budget	Current Period Actuals	LTD Actuals	Obligations	Commitments	Actuals + Obligations + Commitments	Remaining Budget	Percent Remaining
Direct Expenses										
Personnel Expenses	\$1,076,668.00	0.00	\$1,076,668.00	\$6,055.84	\$6,055.84	\$77,380.10	0.00	\$83,435.94	\$993,232.06	92.25%
Professional Salary	\$730,000.00	0.00	\$730,000.00	\$4,760.88	\$4,760.88	\$60,833.40	0.00	\$65,594.28	\$664,405.72	91.01%
Graduate Salary	\$112,000.00	0.00	\$112,000.00	0.00	0.00	0.00	0.00	0.00	\$112,000.00	100.00%
Fringe Benefit Expense	\$234,668.00	0.00	\$234,668.00	\$1,294.96	\$1,294.96	\$16,546.70	0.00	\$17,841.66	\$216,826.34	92.40%
Other Direct Expenses	\$510,000.00	(\$50,000.00)	\$460,000.00	\$523.25	\$8,783.15	0.00	\$0.00	\$8,783.15	\$451,216.85	98.09%
Materials and Supplies	0.00	\$5,000.00	\$5,000.00	0.00	0.00	0.00	0.00	0.00	\$5,000.00	100.00%
Services	0.00	\$130,000.00	\$130,000.00	\$523.25	\$8,783.15	0.00	\$0.00	\$8,783.15	\$121,216.85	93.24%
Sub-Awards	\$450,000.00	(\$185,000.00)	\$265,000.00	0.00	0.00	0.00	0.00	0.00	\$265,000.00	100.00%
Tuition and Fees Expense	\$60,000.00	0.00	\$60,000.00	0.00	0.00	0.00	0.00	0.00	\$60,000.00	100.00%
Total Direct Expenses	\$1,586,668.00	(\$50,000.00)	\$1,536,668.00	\$6,579.09	\$14,838.99	\$77,380.10	\$0.00	\$92,219.09	\$1,444,448.91	94.00%
Facilities and Administration Expense	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%
Total Direct & Indirect	\$1,586,668.00	(\$50,000.00)	\$1,536,668.00	\$6,579.09	\$14,838.99	\$77,380.10	\$0.00	\$92,219.09	\$1,444,448.91	94.00%