#4

COMPLETE

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Q1 Contact Information for Nomination

Name of Contact	**Amy Banicki**
Full Name of State Agency	**Wisconsin Department of Workforce Development**
Email Address	**Amy.Banicki@dwd.wisconsin.gov**
Name of Initiative the state (and/or partnership) is being nominated for:	**Work Search Analytics**

Q2 1. Provide a brief description of the nominee's significant contributions in one of the following areas (your primary focus): building the capacity of its workforce and labor market information functions; developing high impact products and services; OR making an impact on efforts in other states and nationally. Response Word Limit: 150

Criteria: Capacity Building
Work search required claimants must perform at least four work search actions each week. Improperly conducted work searches are a leading cause of non-fraud overpayments. Wisconsin Unemployment Insurance (UI) conducts approximately 30,000 random audits annually of claimant work search actions to educate and assist claimants in satisfying their UI requirements.

To address improper work searches, UI developed an innovative approach applying insight from data to identify claimants needing the most service and improve the effectiveness of business operations and efficiency of staffing resources. Implemented in July of 2019, insights from the analytic model shifted the auditing process from random to ranked.

The analytic process utilizes open-source technology and an innovative approach of model and data development occurring within the business area. Additional partnership with agency IT experts resulted in a robust, repeatable and supported workflow.

Q3 2. Provide a statement of results, accomplishments, impacts and any other appropriate information that demonstrates why the nominee's efforts described in question #1 were an exceptional contribution. Response Word Limit: 200

Wisconsin UI implemented an analytic process shifting work search audits from random to ranked. This process helps claimants most in need to conduct a proper work search and improves the effectiveness of business operations and efficiency of staff resources.

In 2017, Wisconsin conducted approximately 35,000 random audits, resulting in the detection of approximately $3 million in non-fraud overpayments. The denial rate among claims audited was 19.4%.

The pilot process identifies questionable work searches for audit in order to better target claimants who need assistance in conducting valid work search actions. In the first two months, the denial rate for claims prioritized by the model was 38.7%.

Using the higher denial rates and average overpayment amounts from the two-month pilot period and assuming a similar 2017 workload, overpayment detection amounts are projected to be $5.3 million annually. Our goal is to provide education so in time more and more claimants are conducting valid work searches, lowering the denial and overpayment rates.

Wisconsin UI is investigating options to integrate analytics into the online portal, nudging claimants towards properly conducting work searches. By focusing on pre-processed claims, Wisconsin UI will help claimants meet benefit eligibility requirements, reduce overpayments and decrease workload.

Q4 3. Provide a brief description of the nominee's significant contributions in any one of the other two areas listed under "criteria" that you did not focus on above. Response Word Limit: 200

Criteria: National Impact
The construction of the work search analytics pilot occurred in a non-modernized claims system using open source tools and a collaborative business-IT development workflow. Tools and systems may differ across states, but the process of building a data science workflow is a best practice that can be replicated by other states considering similar goals.

The success of this project was enabled by the strategy used to support the project team. The strategy involved great flexibility crossing traditional work roles. The team consisted of cross agency experts including front-line subject matter experts, application systems analysts, IT security, database administrators, systems architects and data scientists. The UI business area develops and maintains the code that identifies questionable claims. IT partners constructed a secure, stable environment to automate the developed code. Front line subject matter experts directly evaluated iterative results to proof out the final model. Systems analysts worked with IT partners to identify analytics integration options.

The lessons learned during the pilot created the beginning of an extensible workflow that can be used for future analytic development. The novel cross discipline approach which allowed the pilot to succeed is as valuable as the results.

Q5 4. Provide samples of work including creative materials, videos, graphics, documents, plans, etc. regarding the efforts and results you outlined in questions #1 and #2.File size limit is 16 MB.Only PDF, DOC, DOCX, PNG, JPG, JPEG, GIF files are supported.

Sample 1 Presentation of Project.pdf (427.2KB)

Q6 Sample of Work #2File size limit is 16 MB.

Sample 2 WorkSearchAuditDataFlow.pdf (152KB)

Q7 Sample of Work #3File size limit is 16 MB.

Sample 3 Result Projections.pdf (429.6KB)

Q8 Sample of Work #4File size limit is 16 MB.

Respondent skipped this question

Q9 Sample of Work #5File size limit is 16 MB.

Respondent skipped this question

Q10 Please upload a statement of approval from the Agency Administrator

Statement of Approval NASWA Data Insights and Innovation.pdf (70.2KB)

Department of Workforce Development
Unemployment Insurance Division
201 E. Washington Avenue
P.O. Box 7905
Madison, WI 53707

STATE OF WISCONSIN
⊙⊙⊙DWD
Department of Workforce Development

Tony Evers, Governor
Caleb Frostman, Secretary

01/08/2020

NASWA Innovation Award Selection Committee
National Association of State Workforce Agencies
444 North Capitol Street, NW Suite 300
Washington, DC 20001

Dear NASWA innovation Award Committee:

I support the nomination of the Work Search Analytics project for the 2020 NASWA State Innovation Award - Data Insights and Innovations.

The Work Search Analytics project builds the Wisconsin Unemployment Insurance (UI) division's staffing capacity through data analytics. By constructing an analytic model and applying data insights, the division identifies claimants most in need of additional education on conducting valid work search actions, thus allowing staff to focus their efforts on providing them assistance. Therefore, the project:
- helps improve the effectiveness of business operations and efficiency of staff resources,
- helps claimants meet benefit eligibility requirements, and
- helps claimants work towards accelerated re-employment by conducting valid work search actions.

Wisconsin's novel approach is cross-disciplined, allowing flexibility with traditional roles. This approach brings together front-line subject matter experts, application systems analysts, IT security, database administrators, systems architects, and data scientists.

Wisconsin created and implemented the project on a legacy system and believes this approach can be utilized by other states regardless of underlying systems and tools. While proven out in post-payment context, the project has the potential to be shifted to pre-payment, directly improving services to customers, project effectiveness, and staff efficiency.
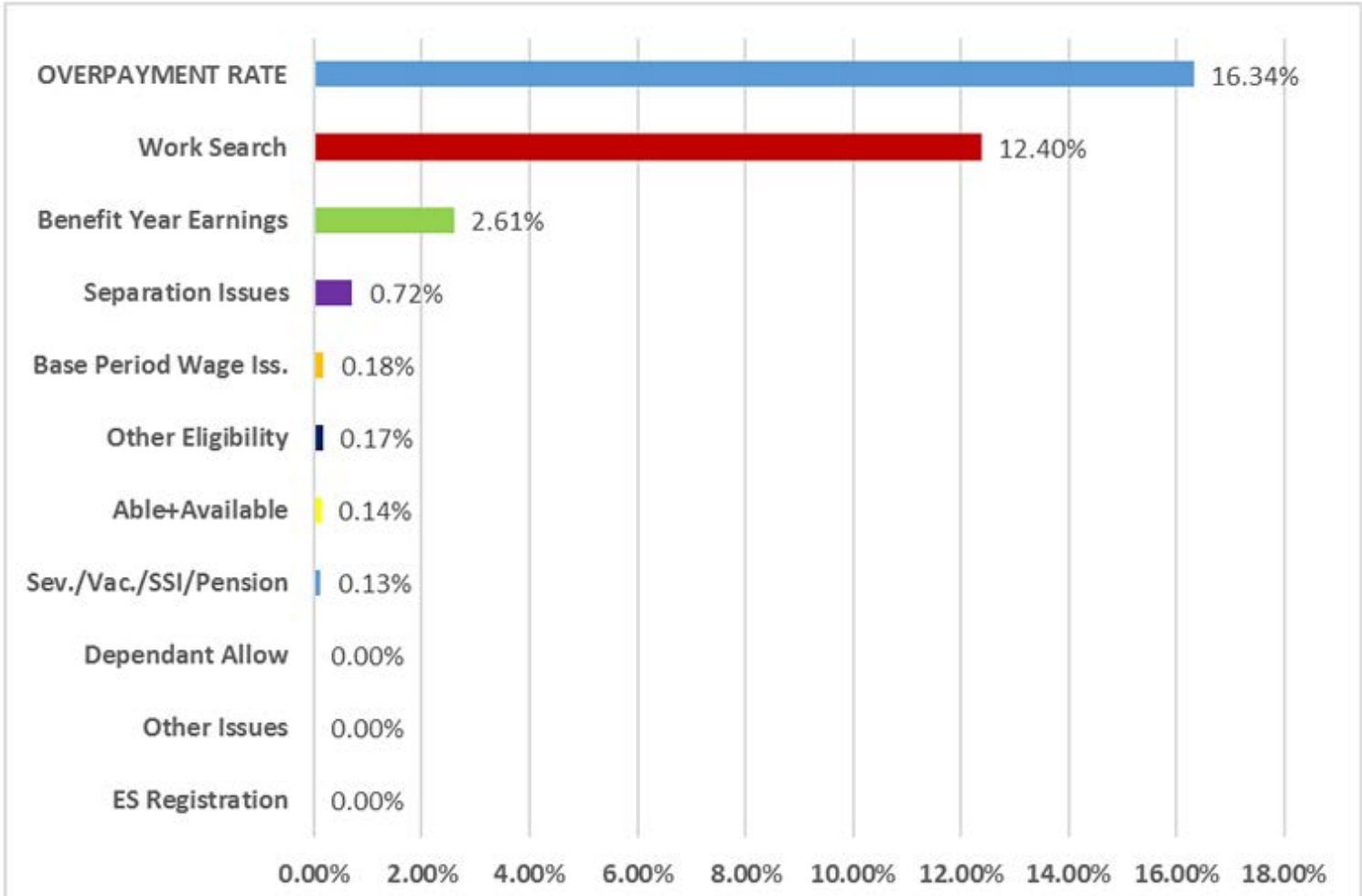
I strongly believe in the Work Search Analytics project. Wisconsin UI believes in using data and analytics to inform the way we deliver services to our customers. It has demonstrated the ability to increase the services we provide customers while increasing staff efficiency. In addition, Wisconsin UI believes a cross collaborative approach is a best practice to achieving new and exciting workforce outcomes.
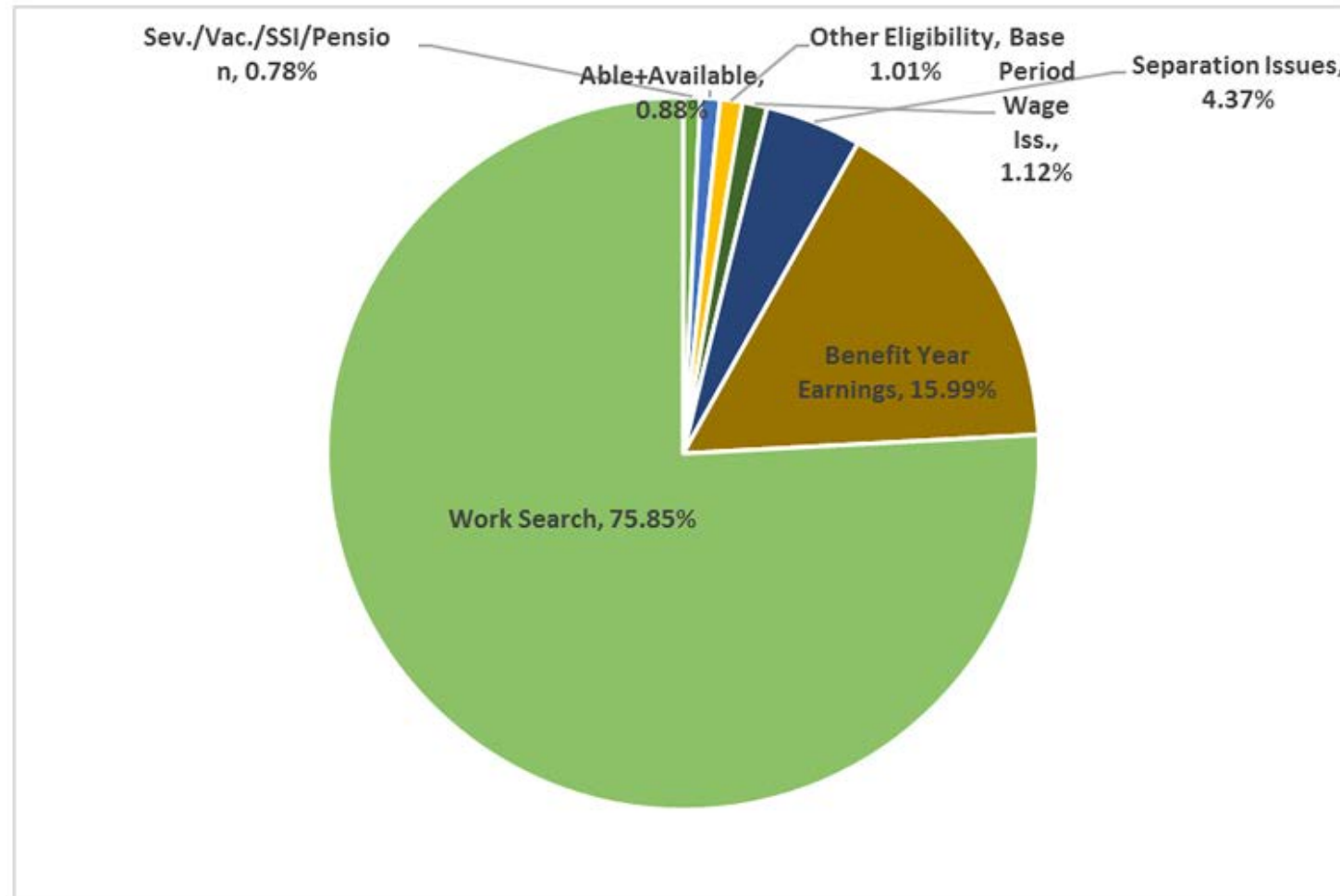
Sincerely,

Mark Reihl
UI Administrator
Department of Workforce Development
State of Wisconsin

This bar chart depicts the state's estimated overpayment and root cause rates as a percent of total UI benefits paid for the three-year period from July 1, 2015 through June 30, 2018:

Category	Rate
OVERPAYMENT RATE	16.34%
Work Search	12.40%
Benefit Year Earnings	2.61%
Separation Issues	0.72%
Base Period Wage Iss.	0.18%
Other Eligibility	0.17%
Able+Available	0.14%
Sev./Vac./SSI/Pension	0.13%
Dependant Allow	0.00%
Other Issues	0.00%
ES Registration	0.00%

UI Improper Payment Root Causes as a Percent of Overpayments

This pie chart depicts the state's estimated overpayment root causes as a percent of total overpayments for the three-year period from July 1, 2015 through June 30, 2018:

Sev./Vac./SSI/Pension, 0.78%
Able+Available, 0.88%
Other Eligibility, 1.01%
Base Period Wage Iss., 1.12%
Separation Issues, 4.37%
Benefit Year Earnings, 15.99%
Work Search, 75.85%

Work Search Analytics Objectives

Build a statistical model that scores the riskiness of a weekly claim as having a problematic work search

Through that process we are testing and identifying red-flag attributes are related to problematic work searches.

- One piece of this effort is to use pattern matching to identify if claimants enter the same or similar employer occupation combinations across weeks of work searches
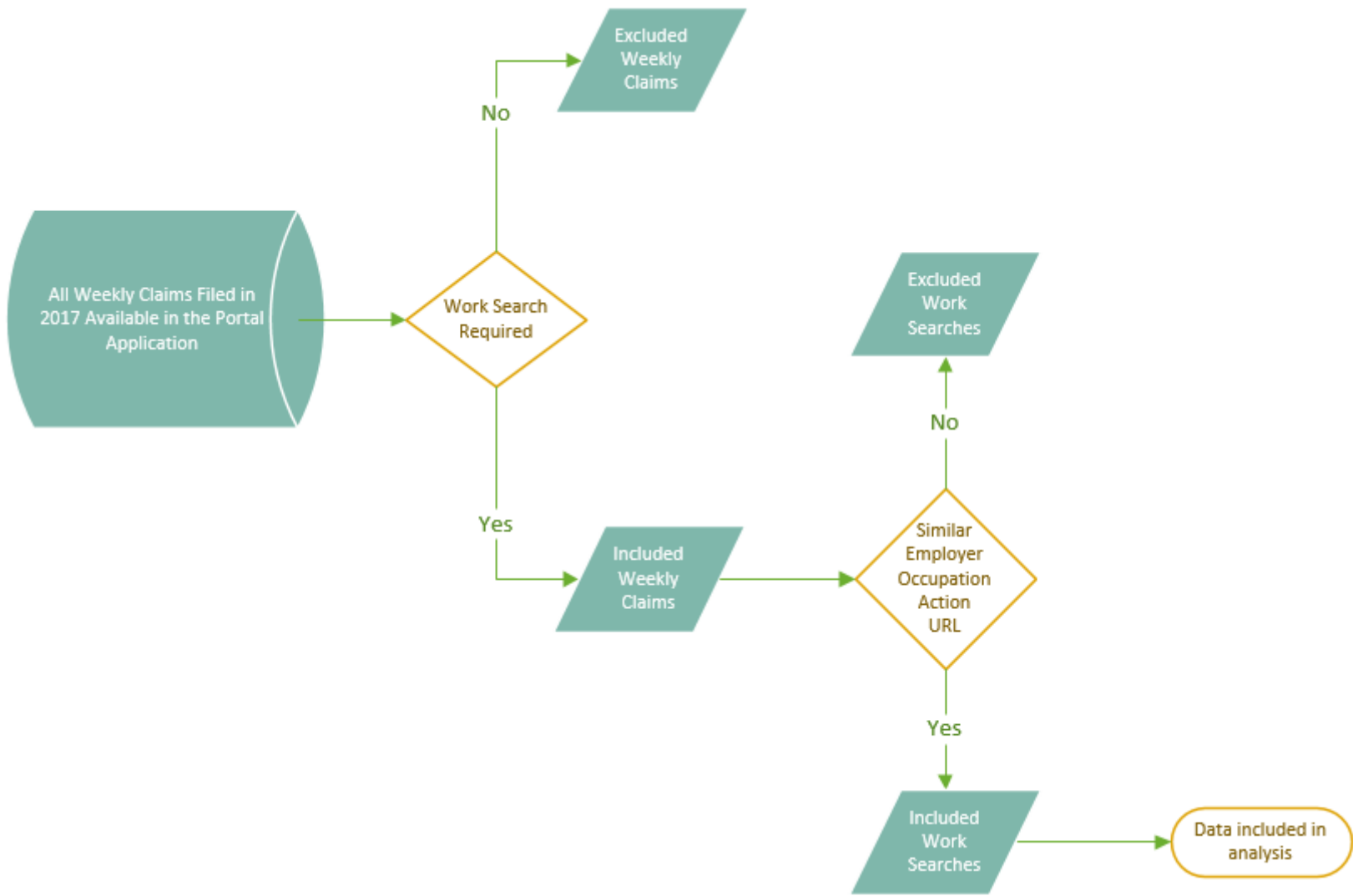
Work Search Required Criteria

ERP CODE

SECOND DIGIT	DESCRIPTION
0	WORK SEARCH REQUIRED
1	WORK SEARCH REQUIRED - REQUIRED BY SS 108.141 OR ILHR 127.06
2	WORK SEARCH WAIVED - RECALL
3	WORK SEARCH WAIVED - NEW EMPLOYMENT
4	WORK SEARCH WAIVED - UNION MEMBER
5	WORK SEARCH WAIVED - APPROVED TRAINING
6	WORK SEARCH REQUIRED - SPECIAL PROGRAM
7	WORK SEARCH WAIVED - PARTIAL WAGES
8	WORK SEARCH WAIVED - NOT CLAIMING
9	WORK SEARCH UNKNOWN

- The portal application records claimant ERPs as of the weekly certification.

- Each of the 894,868 claimants had an ERP with a second digit of either 0 or 1

Similar Employer-Occupation Criteria

WORK SEARCH

ACTIVITY CODE	WORK SEARCH ACTIVITY	WORK SEARCH TYPE FILTER
1	Supplied résumé	Included in string matching analysis
2	Filled out application	Included in string matching analysis
3	Took civil service exam	Not included in the string matching analysis
4	Completed work registration	Not included in the string matching analysis
5	Non-mandatory DWD Re-employment	Not included in the string matching analysis
6	Attended non-DWD Re-employment	Not included in the string matching analysis
7	Registered placement facility	Included in string matching analysis
8	Posted résumé employment website	Included in string matching analysis
9	Registered with a headhunter	Not included in the string matching analysis
10	Met with a career counselor	Not included in the string matching analysis
11	Other	Included in string matching analysis
12	Interview	Included in string matching analysis
13	Attended job fair or career expo	Not included in the string matching analysis
14	Mandatory DWD Re-employment	Not included in the string matching analysis

- Each work search within portal has a corresponding activity code

- String analysis includes activity, website (if entered), employer (if entered), and occupation

- 83% of 2017 Work Search Required Weekly Claims

  (739,789 claims) / (894,868 claims)

- A claimant week was audited if there is the presence of an RA hold on that week

- 35,009 claimant weeks were audited in 2017

- 6,778 claimant weeks were denied due to improper work search

- 28,231 claimant weeks had adequate work searches

WORK SEARCH DENIAL

FAMILY CODE	RESOLUTION CODE
AA	140
AA	150
AA	170
QE	550
WS	100
WS	110

Finding Near or Exactly Duplicated Work Searches

2 Types of Duplicates

Within Week

Between Week

SSN	YEAR WEEK OF CLAIM	EMPLOYER	OCCUPATION	Work Search Activity	Combined String
~~555555555~~	~~201704~~			~~JCW System Generated~~	
555555555	201704	Southern Company	Operations Manager	Supplied résumé	Southern CompanyOperations Manager
555555555	201704	Touchstone energy	Powerplant operator	Supplied résumé	Touchstone energyPowerplant operator
555555555	201704	Suthern Company	Operations Manager	Supplied résumé	Suthern CompanyOperations Manager

	Southern CompanyOperations Manager	Touchstone energyPowerplant operator	Suthern CompanyOperations Manager
Southern CompanyOperations Manager	0	26	1
Touchstone energyPowerplant operator	26	0	27
Suthern CompanyOperations Manager	1	27	0

SSN	YEAR WEEK OF CLAIM	EDIT DISTANCES	DUPLICATE WEEK FLAG
55555555	201704	[26, 1, 27]	1

RULE

DUPLICATE WEEK FLAG = 1

IF EDIT DISTANCES CONTAINS 0, 1, 2,3,4,5,6

- Work searches in key weekly claim compared to previous 4 weeks

- Estimate matrix of string edit distances between work searches + additional claim data

- String edit distances of 6 or less are considered duplicate work searches

SSN	YEAR WEEK OF CLAIM
123456789	201704
123456789	201705
123456789	201706
123456789	201707
123456789	201708
123456789	201710

201808 Week Flag Includes:

Work search in 201708 compared across year weeks 201704, 201705, 201706, 201707

201710 Week Flag Includes:

Work search in 201710 compared across year weeks 201706, 201707, 201708

2017

- 9.47% of weekly claims sent for audit contained duplicates
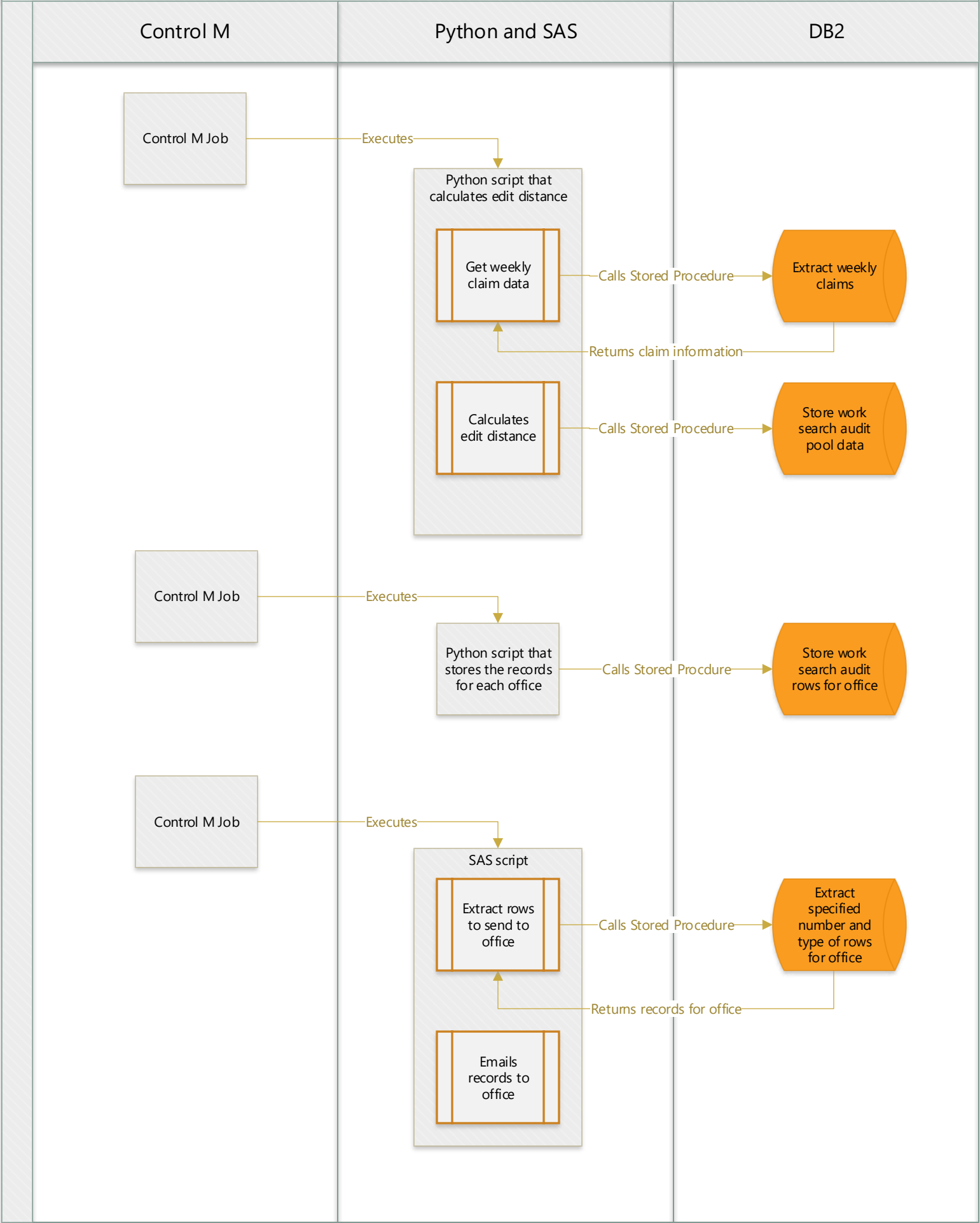- **35,009 audits → $3,074,724 detected overpayments**

Pilot

- 48.19% of weekly claims sent for audit contained duplicates
- **Estimated detected overpayments asuming 2017 workload and audit targeting**

Work Search Audit Process Flow

Control M	Python and SAS	DB2

Control M Job —Executes→

Python script that calculates edit distance

- **Get weekly claim data** —Calls Stored Procedure→ **Extract weekly claims**
- ←Returns claim information—
- **Calculates edit distance** —Calls Stored Procedure→ **Store work search audit pool data**

Control M Job —Executes→

Python script that stores the records for each office —Calls Stored Procdure→ **Store work search audit rows for office**

Control M Job —Executes→

SAS script

- **Extract rows to send to office** —Calls Stored Procedure→ **Extract specified number and type of rows for office**
- ←Returns records for office—
- **Emails records to office**

Work Search Audit Responsibilities

BITS Architect	BITS TSS	UI TSS	CEDARS	DB2 DBA	CPS
Setup Control M control job	Setup Python server	Write Python scripts	Review and productionize Python scripts	Deploy database objects	Monitor Control M jobs
Create/Maintain Control M configuration file including encrypted connection information	Install Python Packages	Test Python scripts	Deploy Python scripts to production server	Maintain stored procedures	
			Interface with CPS	Alter attributes that control work search audit data pull	

Audited Weekly Claims: Claim Denial (%), Average Detected Overpayment Amount ($)

28.7% $485.80 — Duplicates

18.4% $448.46 — Non-Duplicates

38.7% $526.58 — Duplicates

21% $486.23 — Non-Duplicates
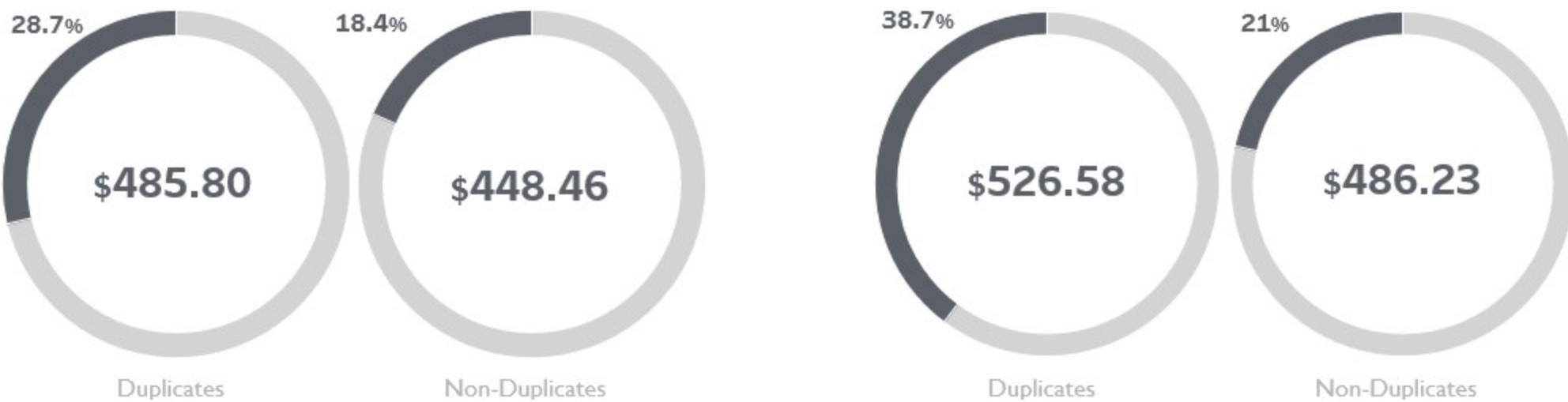
2017
- 9.47% of weekly claims sent for audit contained duplicates
- **35,009 audits → $3,074,724 detected overpayments**

Using the Pilot Audit Percentage

Pilot
- 48.19% of weekly claims sent for audit contained duplicates
- **Estimated detected overpayments asuming 2017 workload and audit targeting**

Percentage of Audits as Duplicates

48.19%

Duplicates

Average Overpayments
$526.58

Denial Rates
38.70%

Non-Duplicates

Average Overpayments
$486.23

Denial Rates
21.00%

35,009 Work Searches Audited
$5,290K Expected Overpayments

$3,074,724

35,009

(Chart axis values: $8,000K, $6,000K, $4,000K, $2,000K, $0K; 0K, 10K, 20K, 30K, 40K, 50K, 60K; marker at 20,348)

Audited Weekly Claims: Claim Denial (%), Average Detected Overpayment Amount ($)

28.7%   **$485.80**   18.4%   **$448.46**   38.7%   **$526.58**   21%   **$486.23**
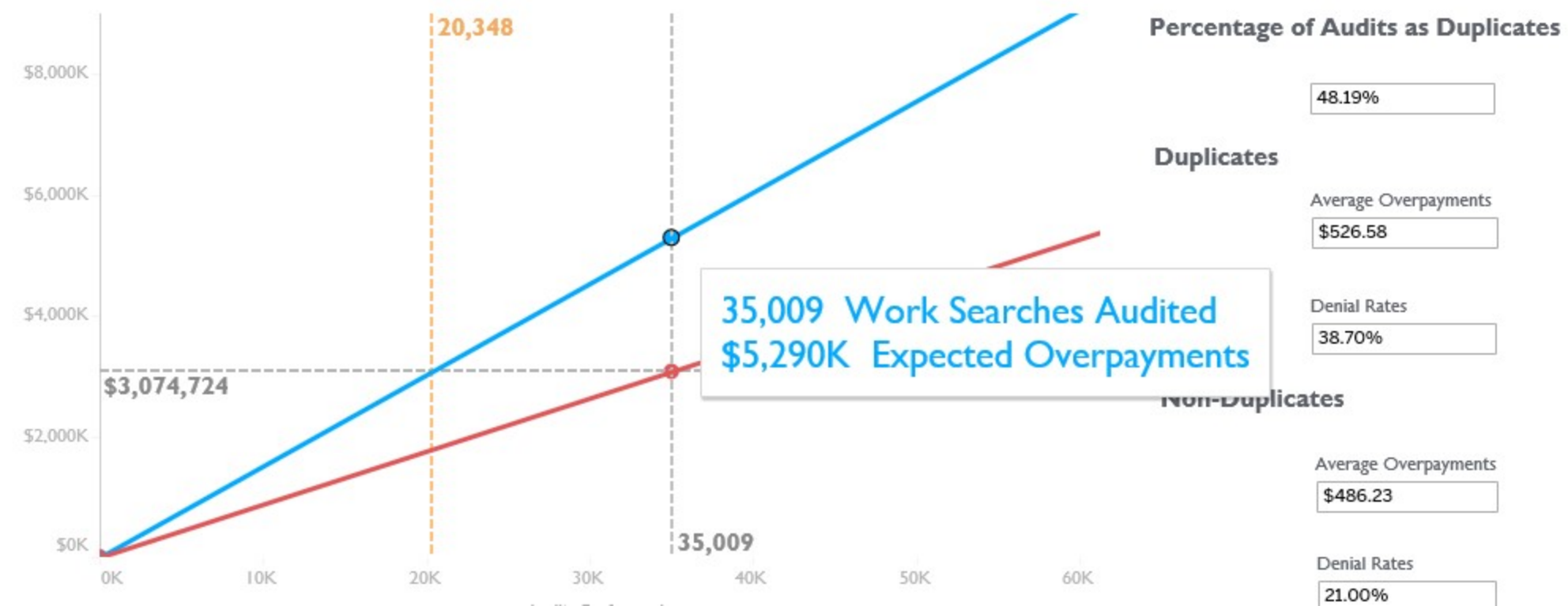
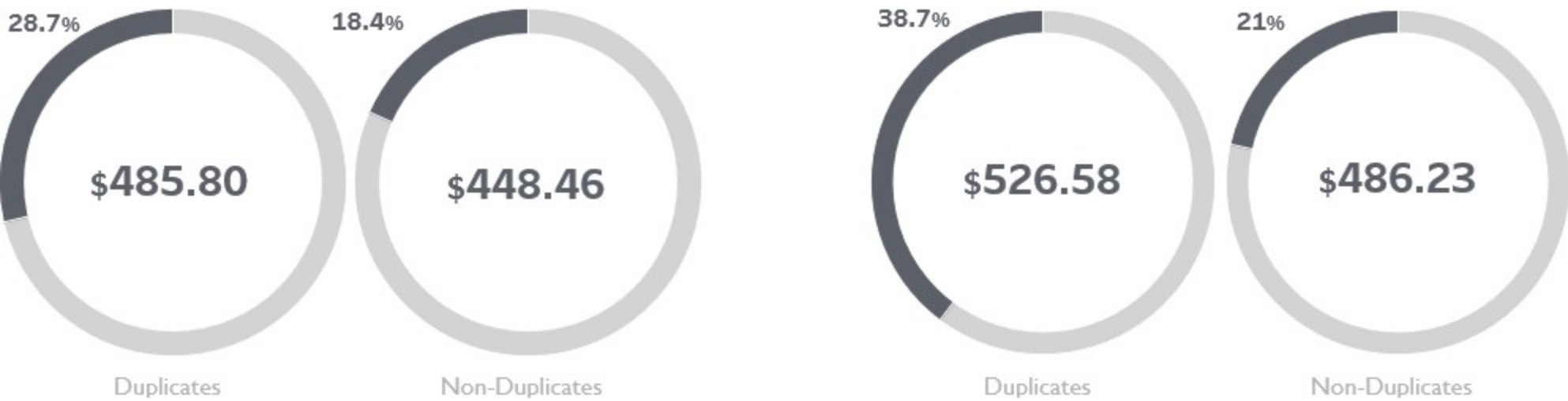Duplicates   Non-Duplicates   Duplicates   Non-Duplicates

2017
- 9.47% of weekly claims sent for audit contained duplicates
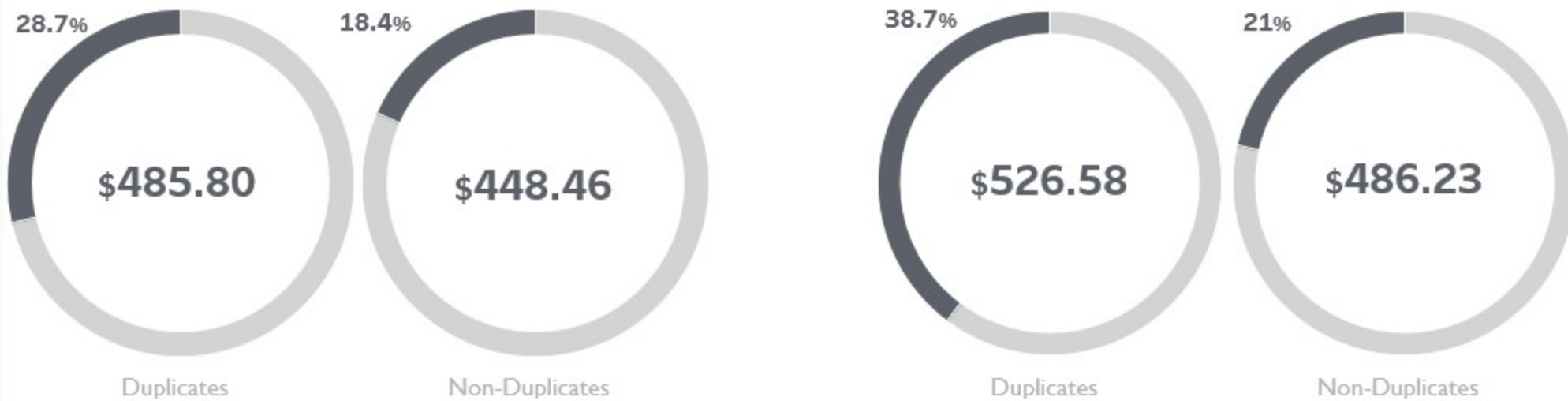- **35,009 audits → $3,074,724 detected overpayments**

Results with 75% of Audits Duplicates

Pilot
- 48.19% of weekly claims sent for audit contained duplicates
- **Estimated detected overpayments asuming 2017 workload and audit targeting**

17,238

$8,000K

$6,000K

35,009 Work Searches Audited
$6,244K Expected Overpayments

$4,000K

$3,074,724

$2,000K

$0K

0K   10K   20K   30K   40K   50K   60K

35,009

Audits Performed

Percentage of Audits as Duplicates

75.00%

Duplicates

Average Overpayments
$526.58

Denial Rates
38.70%

Non-Duplicates

Average Overpayments
$486.23

Denial Rates
21.00%

Audited Weekly Claims: Claim Denial (%), Average Detected Overpayment Amount ($)

28.7%	18.4%	38.7%	21%
$485.80	$448.46	$526.58	$486.23
Duplicates	Non-Duplicates	Duplicates	Non-Duplicates

2017
- 9.47% of weekly claims sent for audit contained duplicates
- **35,009 audits → $3,074,724 detected overpayments**

Results with 30% of Audits Duplicates

Pilot
- 48.19% of weekly claims sent for audit contained duplicates
- **Estimated detected overpayments asuming 2017 workload and audit targeting**

Percentage of Audits as Duplicates

30.00%

Duplicates

Average Overpayments
$526.58

Denial Rates
38.70%

23,186

35,009

$3,074,724

35,009 Work Searches Audited
$4,643K Expected Overpayments

licates

Average Overpayments
$486.23

Denial Rates
21.00%