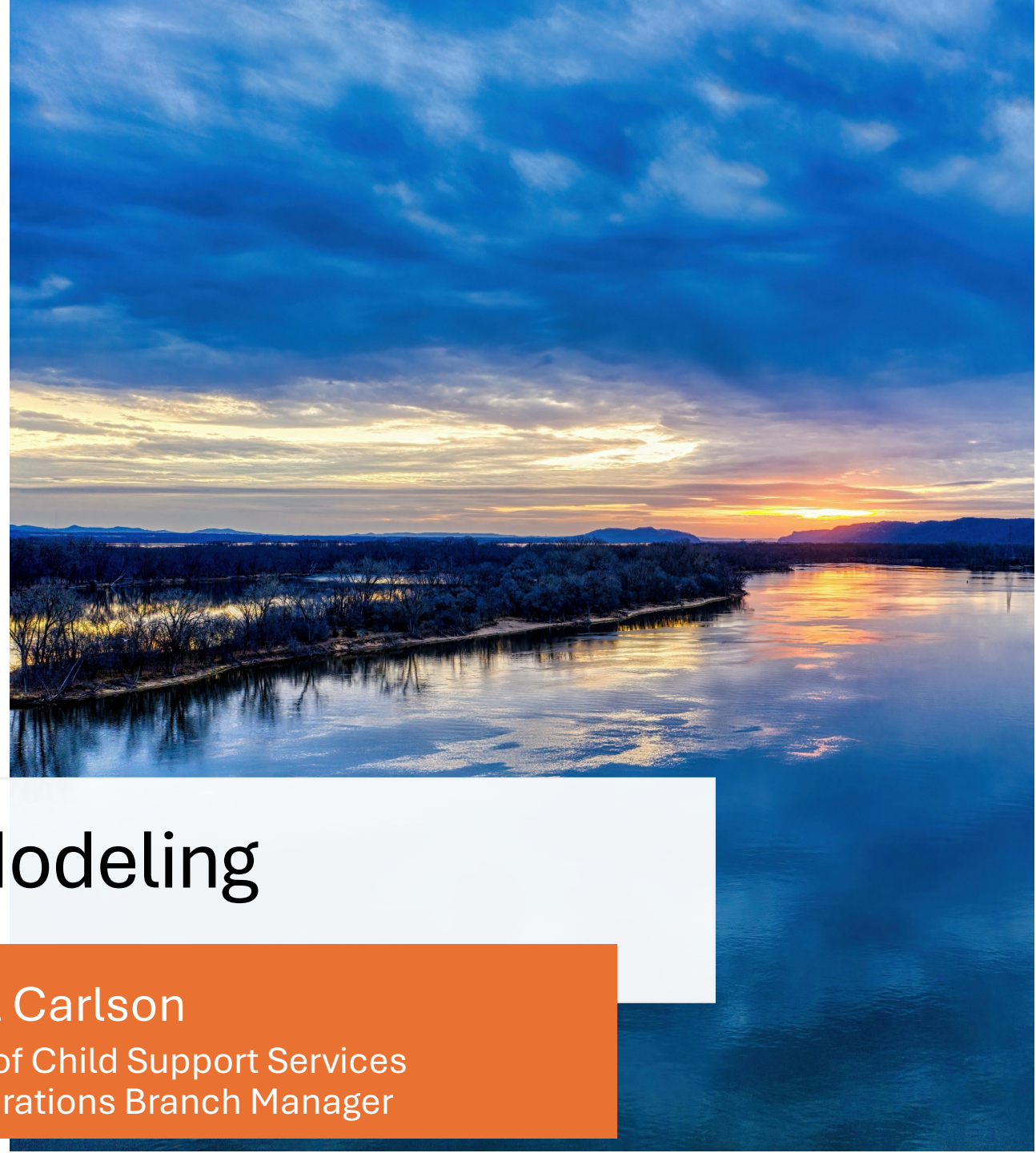




Data Modeling

Cheryl Carlson

California Department of Child Support Services
Infrastructure and Operations Branch Manager

The Opportunity – Connect with the Business

- In the Beginning, Technology Focused
 - Both logical and physical database design conducted by technologists
- Evolve into Business and Technology Focused
 - Logical design by the business physical design by the technologists
- Be Future Focused
 - Consider business opportunities and foundational technology to get you there





The Foundation – Cloud Infrastructure

- Flexibility to Grow
- Cost Management
- Collaborative Culture





The Future – Create a Data Vision

- Consistency – Look to your Agency's Strategic Vision
- Create Deliberate Partnerships
- Start Small and be Agile





Child Support Paid Data Model

Jeffrey Olson MBA
Peter J. Castro PhD. (abd)

Context

Project Purpose:

Develop a contextual learning model addressing the current collections Federal Performance Measure.

Definition:

Current Collections is the total amount of support distributed as current support during the federal fiscal year (FFY) divided by the total amount of current support due for the fiscal year.

$$\begin{array}{c} \text{Current} \\ \text{Support} \\ \text{Collected} \\ \text{FFY} \end{array} \div \begin{array}{c} \text{Current} \\ \text{Support} \\ \text{Due} \\ \text{FFY} \end{array} = \begin{array}{c} \text{Current} \\ \text{Collections} \\ \% \end{array}$$



Trends:

- The State of Minnesota has not achieved the 80% Collections on Current Support goal in over a decade.

Current Practices:

- Non-Custodial Parents receive traditional enforcement measures.
- Counties are put on Performance Improvement Plans impacting funding.

Business Case

Extenuating factors:

- Economic downturns, employment instability, and accumulated arrears often pose challenges to compliance.

Conclusion:

- The State of Minnesota serves as a compelling case study due to its structured child support system that integrates financial assessments, income-based modifications, and employment support programs.





The Future: Create a Data Vision

Past



Minnesota counties were given a threshold goal they must meet for this performance measure.



A historical threshold model has been used to evaluate and discuss actions for performance.



Historical model although very practical presents some challenges.



Does not account for factors out of county's control.



Does not address county's unique profile.

Present



Multiple models used to analyze and learn data based on each county's size and characteristics.



Recommendations given are unique to each county based on variables influencing their current collections.



Performance updates provided on a quarterly basis.



Thresholds based on statistically informed analysis and Federal Performance Measure.



Updated case lists provided monthly.



Data-Driven Threshold Setting: Goals

Design

Empower

Statistical
Analysis

Align

Localized





Data-Driven Threshold Setting: Method

Benchmarking Against Federal Guidelines

- **80% Threshold:** The federal performance guideline serves as the primary benchmark for categorizing counties as low risk.
- **Consistency:** state standards are then aligned with federal performance incentives.

Risk Thresholding via Quantile Scoring

- **Quantile-Based Tuning:** The data is segmented into risk categories based on the empirical distribution of values.
- **Adjustment for Local Variability:** A flexible scoring buffer accounts for regional or programmatic sensitivity.



Quantile-Based Risk Bands

Risk Categories by Quantile Band

80-100%
Low Risk

66-79%
Moderate-Low Risk

50-65%
Moderate-High Risk

0-49%
High Risk

Adjusting for Local Variability

- **Buffer Zones ($\pm 10\%$):** A tolerance zone inserted around quantile thresholds
- **Demographic Factors:** Accounts for geography (e.g., poverty, rurality, language barriers)
- **Programmatic Flexibility:** Structural factors in new or growing programs considered
- **Dynamic Recalibration:** Thresholds updated to reflect current conditions



Predictive Model Approach & Implementation

- Uses machine learning models to analyze compliance patterns.
- **Data:** 200,000+ cases from 87 counties (2017-2024).
- **Key models:** Several different models based on dataset (county)
- **Training Data:** Historical child support records from Minnesota.

TRAINING DATA FOR BUILDING A DATA MODEL

TRAINING DATA			
	A	0	Output
1.21	A	0	Yes
1.12	B	1	No
1.17	C	0	Yes
1.21	A	1	No
1.15	B	1	Yes

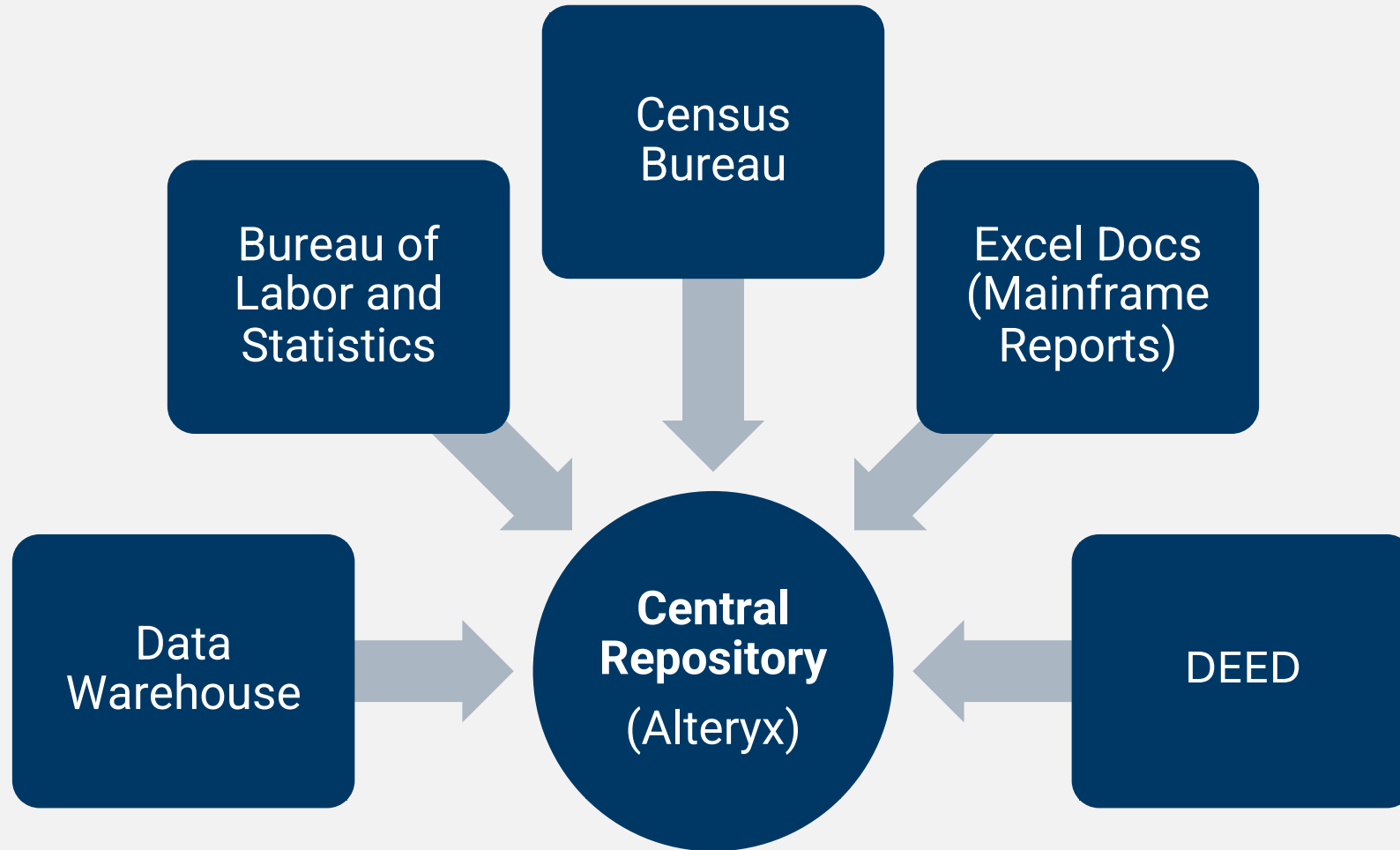


**DATA
MODEL**





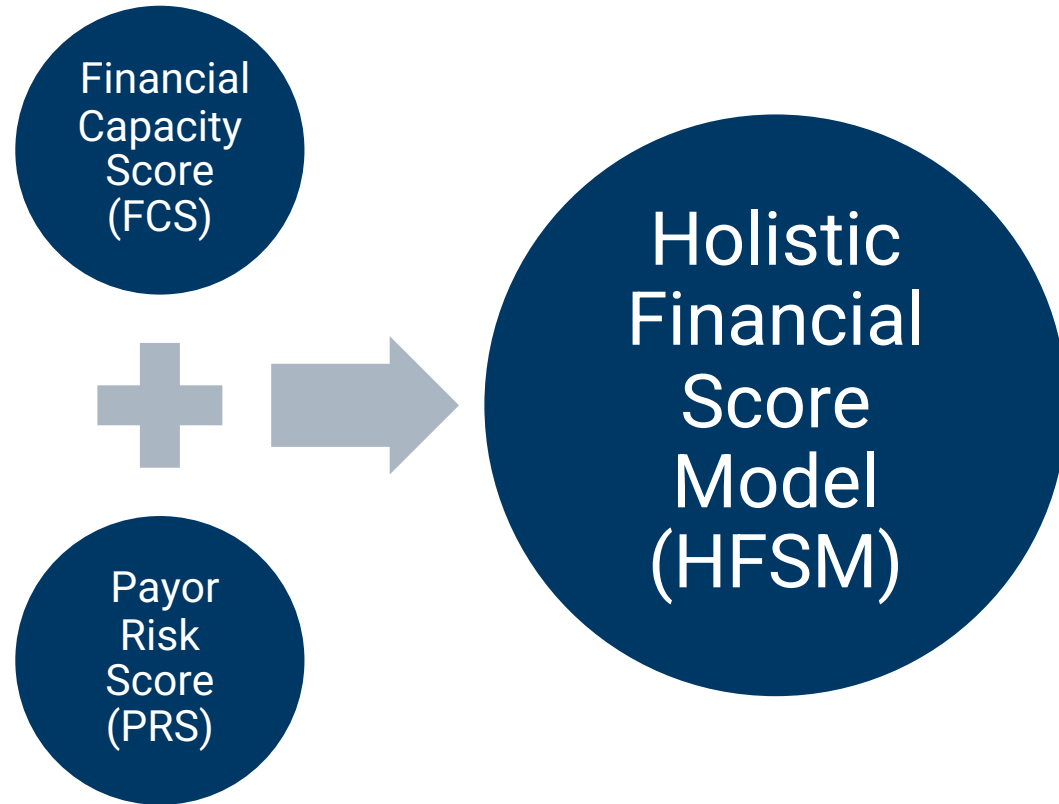
Data Flow Diagram





Data/Policy/Mathematics Meets Technology

Holistic Financial Score Model



Focuses on:

- Efficiency
- Optimization
- Strategy Alignment

$$\text{HFSM} = (\text{Financial Capacity Score} * 0.80) + (\text{Payor Risk Score} * 0.20)$$



HFSM: Efficiency

Definition:

Efficiency measures how effectively resources are used to achieve specific outcomes

Key Question:

Are we using our resources efficiently to *achieve desired results*?

Examples:

- **Financial Capacity Score:** Evaluates how effectively wages and resources are allocated to manage arrears and meet obligations.
- **Payor Risk Score:** Assesses consistency and reliability in fulfilling financial responsibilities with minimal waste or lapses.





HFSM: Optimization

Definition:

Optimization involves finding the most effective solution or arrangement within a defined set of constraints.

Key Question:

Are we achieving the *best possible outcome* given the constraints we face?

Examples:

- Adjusting weights (β , α , δ) to emphasize the most influential components in each scenario.
- Optimizing policies to overcome key limitations—for example, enhancing **financial literacy** (behavioral constraint) to help reduce **arrears** (capacity constraint).





HFSM: Strategic Alignment

Definition:

Strategy involves long-term planning and decision-making to achieve overarching goals

Key Question:

Are our DCYF efforts aligned to support *long-term program success*?

Core Components:

- **Tool Creation:** Management, Evaluation, Intervention
- **Enforcement**  **Cooperative Game Theory**

Examples:

- Design interventions using HFSM insights—e.g., targeted financial aid or local economic support—to drive sustainable improvement.
- Strategically leverage county-specific characteristics (δ) to address regional disparities in outcomes.



Tableau Landing Page



DEPARTMENT OF CHILDREN,
YOUTH, AND FAMILIES

Child Support Division

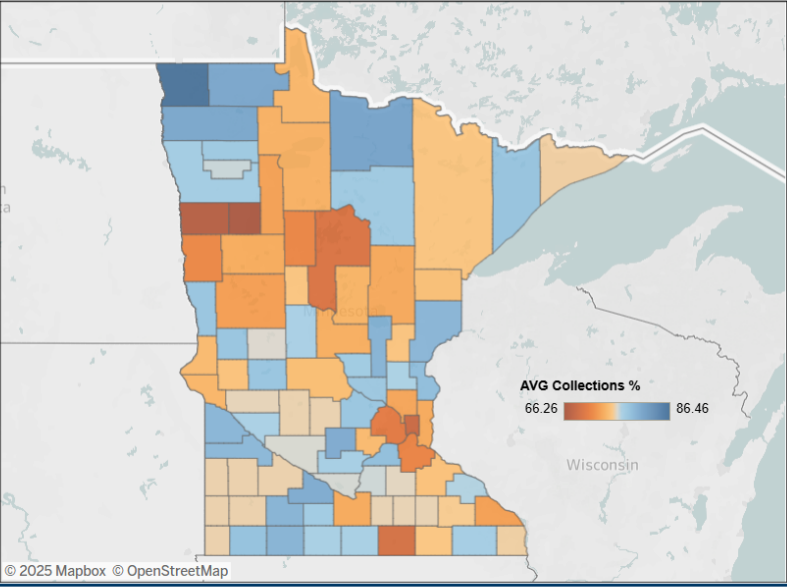
Current Collections- Data Model Home Page

Statewide View

County View

Fed. Fiscal Year	Fed. Fiscal Quarter	%
2020	Q3	76.554
	Q4	77.261
2021	Q1	76.912
	Q2	76.816
	Q3	77.275
	Q4	76.697
2022	Q1	74.584
	Q2	74.865
	Q3	75.583
	Q4	75.493
2023	Q1	75.595
	Q2	76.116
	Q3	76.225
	Q4	76.147
2024	Q1	76.052
	Q2	76.061
	Q3	76.522
	Q4	76.035
2025	Q1	75.426
	Q2	75.820

Collection Rate Heat Map



© 2025 Mapbox © OpenStreetMap

County Name
(All)

Tier
(All)

Big 9
(All)

District Court
(All)

MFSRC District
(All)

Economic Development Region
(All)

State Planning Area
(All)

Navigation Tips:
Statewide View- summarize and compare aggregate collections and model variables of an individual county to another county or groupings.
County View- access more detailed information about an individual county, including model variables, recommendations, and downloadable reports.

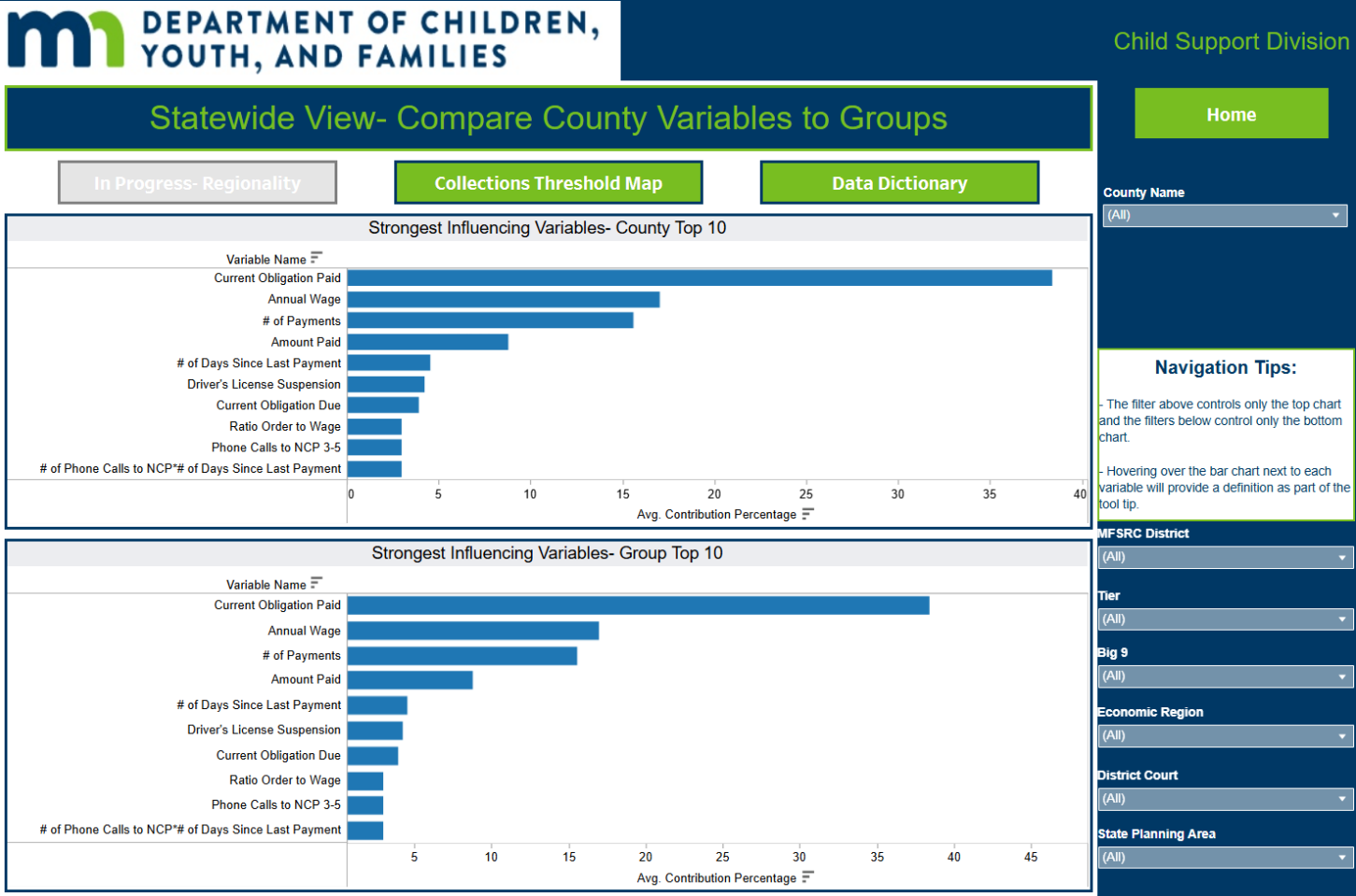
Financial Capacity Reports



Child Support Division

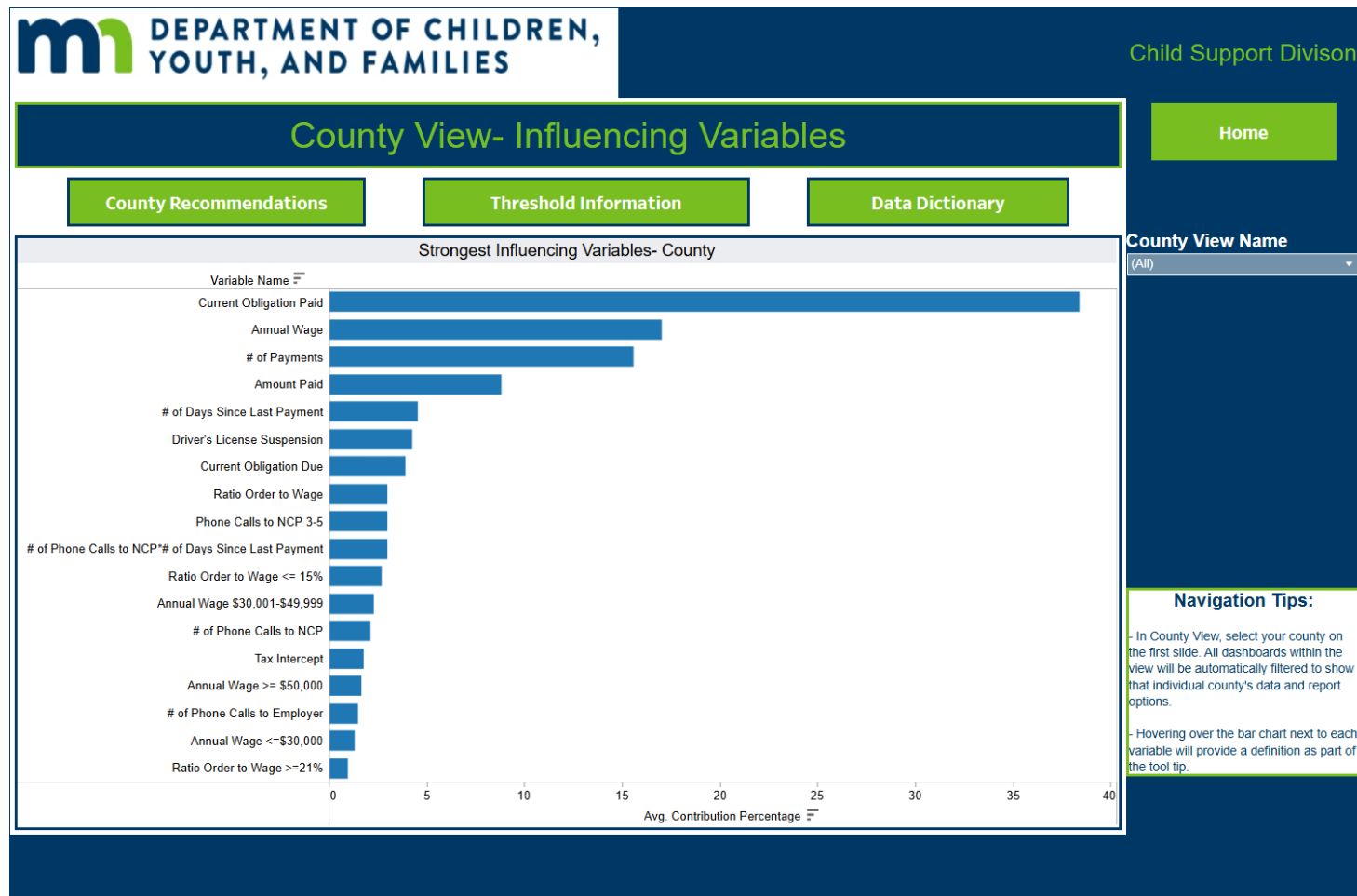


Statewide View (Cont'd)





County View





County View (Cont'd)

 **DEPARTMENT OF CHILDREN,
YOUTH, AND FAMILIES**

Child Support Division

County View- Recommendations

County Influencing Variables

Threshold Recommendations

Data Dictionary

Recommendations		
Variable Name (Recommendati..	Variable Specific Recommendations	#
# of Days Since Last Payment	Encourage consistent payments when communicating with participants. Provide various ways to pay (MCSO, mail, in-person, PayNearMe,etc).	1
	Implement reminders and outreach processes to reduce late payments. Contact CP, if appropriate.	2
	Work Monthly Standard Reports F19: Cases with Recent Non-Payment, P06: Cases in Full Locate, and P16: Cases moved to Full Locate in the Prior Month.	3
# of Payments	Interaction effects between Phone Calls to NCP and Days Since Last Payment variables show that increased phone call reminders close to payment due dates can reduce payment delays.	1
	Focus on ensuring timely payments and monitor frequent payers closely.	2
	Monitor regular payors and implement strategies to maintain consistency.	3
# of Phone Calls to Employer	Review E0014 worklists for appropriate cases to contact employer.	1
# of Phone Calls to NCP	Additional Phone Calls to NCP tends to increase the collection rate for county.	1
	Increase engagement strategies for improved communication with NCP.	2
Amount Paid	Provide incentives for payors to transition to full payments (ex: AMPP PA Arrears \$ for S).	1
	Change in payments (# or amount) may signal a change of circumstances. Review to see if modification is appropriate.	2
Annual Wage	Low Income: Consider intervention strategies, such as payment reminders or incentive-based approaches; High Income: stricter	1

Home

County View Name
(All)

Recommendations Type

☐ Variable Recommendations

☒ General Recommendations

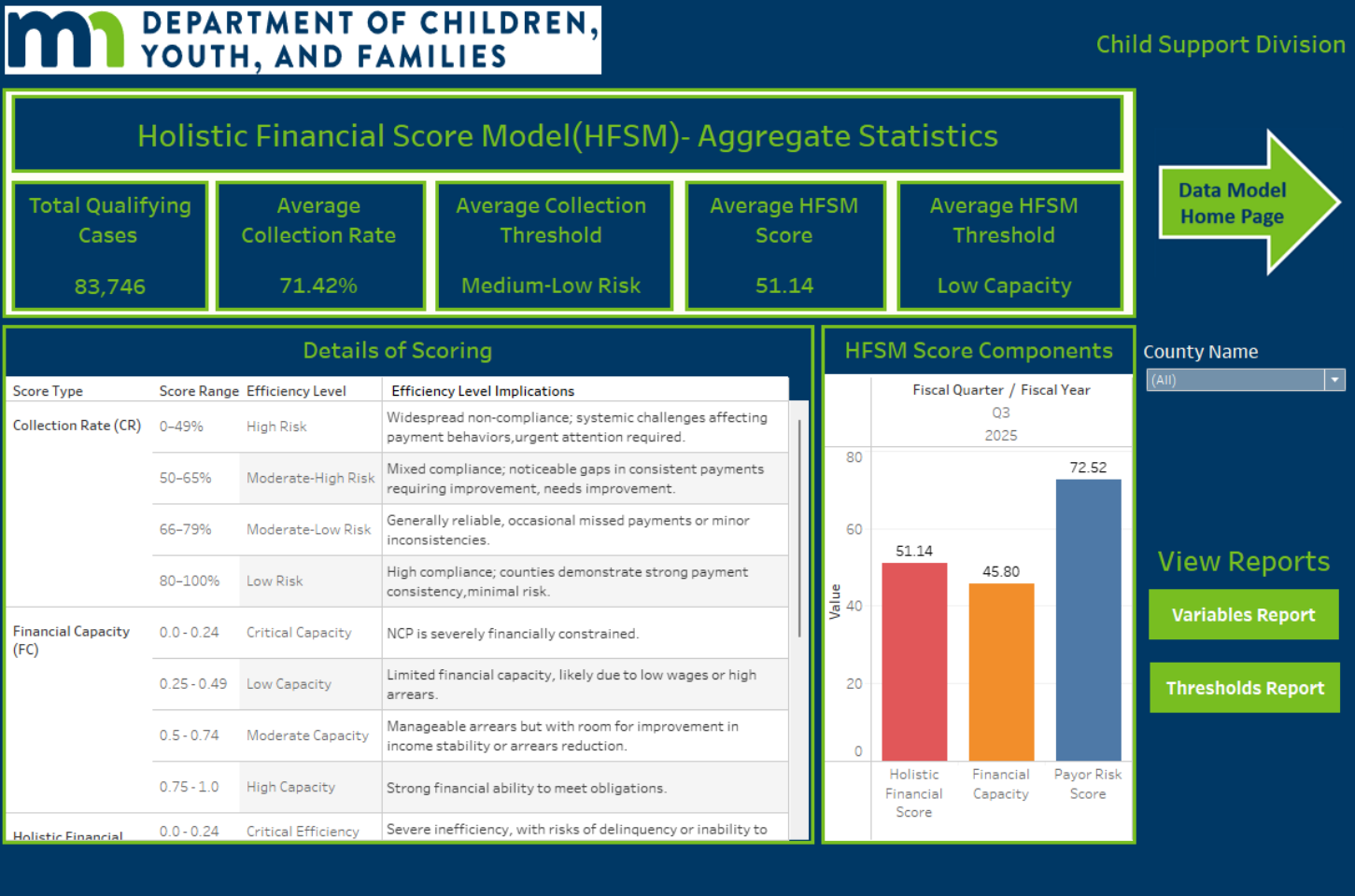
Navigation Tips:

- In County View, select your county on the first slide. All dashboards within the view will be automatically filtered to show that individual county's data and report options.

- Hovering over a value in the # column will provide a definition of the variable as part of the tool tip.



Financial Capacity Reports





Variable-based Report

m

DEPARTMENT OF CHILDREN,
YOUTH, AND FAMILIES

Child Support Division

County Name

(All)

Collection Threshold

☒ (All)
☒ High Risk
☒ Low Risk
☒ Moderate-High Risk
☒ Moderate-Low Risk

Ratio Order to Wage

☒ (All)
☒ ROTW 16-20%
☒ ROTW <=15%
☒ ROTW >20%
☒ UNKNOWN

Wage Level

☒ (All)
☒ <= \$30,000
☒ >= \$50,000
☒ \$30,001-\$49,999
☒ UNKNOWN

NCP Phone Calls

☒ (All)
☒ NCP Calls 3-5
☒ NCP Calls <=2
☒ NCP Calls >5

DL Suspension

☒ (All)
☒ No
☒ Yes

CFCRS Home

Threshold Report

Variable Based Report

Id Case	I_R	Worker	Child Count	NCP Cases	Yearly Wage	Last Payment	Curr Due	Current Arrears	Collection Rate	Collection Threshold
1			1	1	\$5,973.00	02/23/2024	\$404.00	\$9,167.00	0	High Risk
1			1	1	Null	05/22/2025	\$62.00	\$0.00	97.46	Low Risk
1			1	1	\$67,961.41	06/01/2025	\$983.00	\$0.00	100	Low Risk
1			1	1	\$55,478.00	06/25/2025	\$558.00	\$9,634.69	95.35	Low Risk
1			1	6	Null	04/24/2024	\$55.00	\$1,499.41	0	High Risk
1			1	1	\$34,654.90	06/16/2025	\$64.00	\$0.00	100	Low Risk
1			1	2	\$43,436.41	06/18/2025	\$508.00	\$15,801.89	100	Low Risk
1			1	1	\$37,738.24	06/18/2025	\$1,108.00	\$422.09	94.05	Low Risk
1			1	3	\$7,903.57	06/13/2025	\$78.00	\$12,844.22	28.04	High Risk
1			1	1	Null	05/23/2025	\$68.00	\$3.00	83.01	Low Risk
1			1	1	Null	Null	\$188.80	\$8,034.32	0	High Risk
1			1	4	\$900.00	11/10/2024	\$61.00	\$944.54	46.28	High Risk
1			1	1	\$42,106.67	06/20/2025	\$827.00	\$0.00	97.72	Low Risk
1			1	1	\$131,082.63	06/13/2025	\$262.00	\$0.00	100	Low Risk
1			1	1	\$39,530.93	06/20/2025	\$1,368.00	\$0.00	94.08	Low Risk
1			1	2	\$15,022.36	09/06/2024	\$59.00	\$812.36	24.25	High Risk
1			1	5	\$4,555.00	07/22/2024	\$472.00	\$1,765.47	16.61	High Risk
1			1	2	\$28,163.87	04/18/2025	\$463.00	\$491.42	70.51	Moderate-Low Risk
1			1	2	\$7,623.09	02/17/2025	\$433.00	\$6,703.02	5.46	High Risk
1			1	1	\$75,076.67	05/09/2025	\$350.00	\$643.50	86.12	Low Risk
2			2	1	\$13,167.79	06/02/2025	\$88.00	\$125.88	56.37	Moderate-High Risk

Download Excel

Download PDF



Download Excel



Ongoing Steps

Continue with pre-pilot work

- Ramsey & Yellow Medicine Counties
- Monthly Meetings

Invite additional counties for full pilot early 2026

- Build on pre-pilot work
- Continued evolution of deliverables
 - Dashboards
 - Training

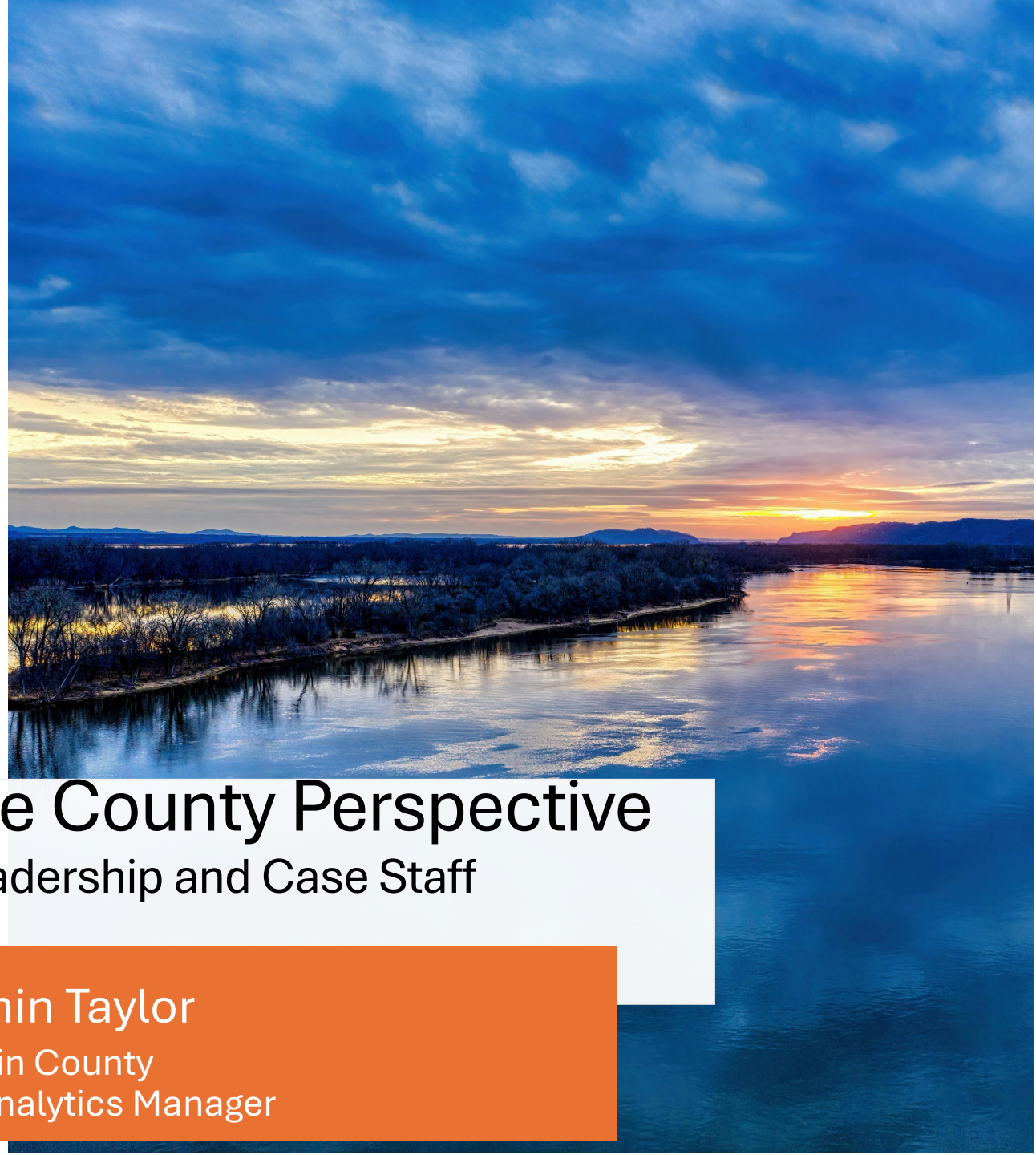
Launch for all counties late 2026



Data Modeling and the County Perspective

Building Capacity in Leadership and Case Staff

Benjamin Taylor
Hennepin County
CQI and Data Analytics Manager



Hennepin County Child Support

- Over 40,000 cases served last year
- 208 Staff
 - 178 Case Specialists
 - 9 Support Staff
 - 19 Managers and Supervisors
 - 1 Data Analyst
- Specialized into 10 functions
- Access to MN Data Warehouse and County Data Tools





Changes in Modern CS Data Work

Challenges

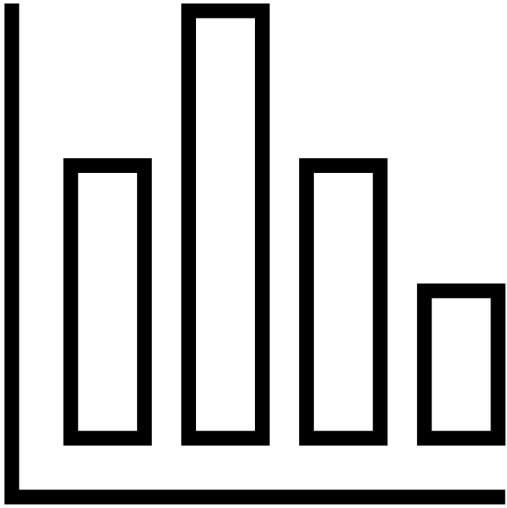
- Legacy systems don't meet data needs out of the box
- Existing reporting is focused on generating lists of cases or high-level metrics
- Perceptions of previous data work is as evaluation only

Opportunities

- Tools like RStudio, PowerBI, and Tableau provide a lower barrier to entry
- Robust data warehouse infrastructure
- New case workers come in with greater data literacy and higher expectations



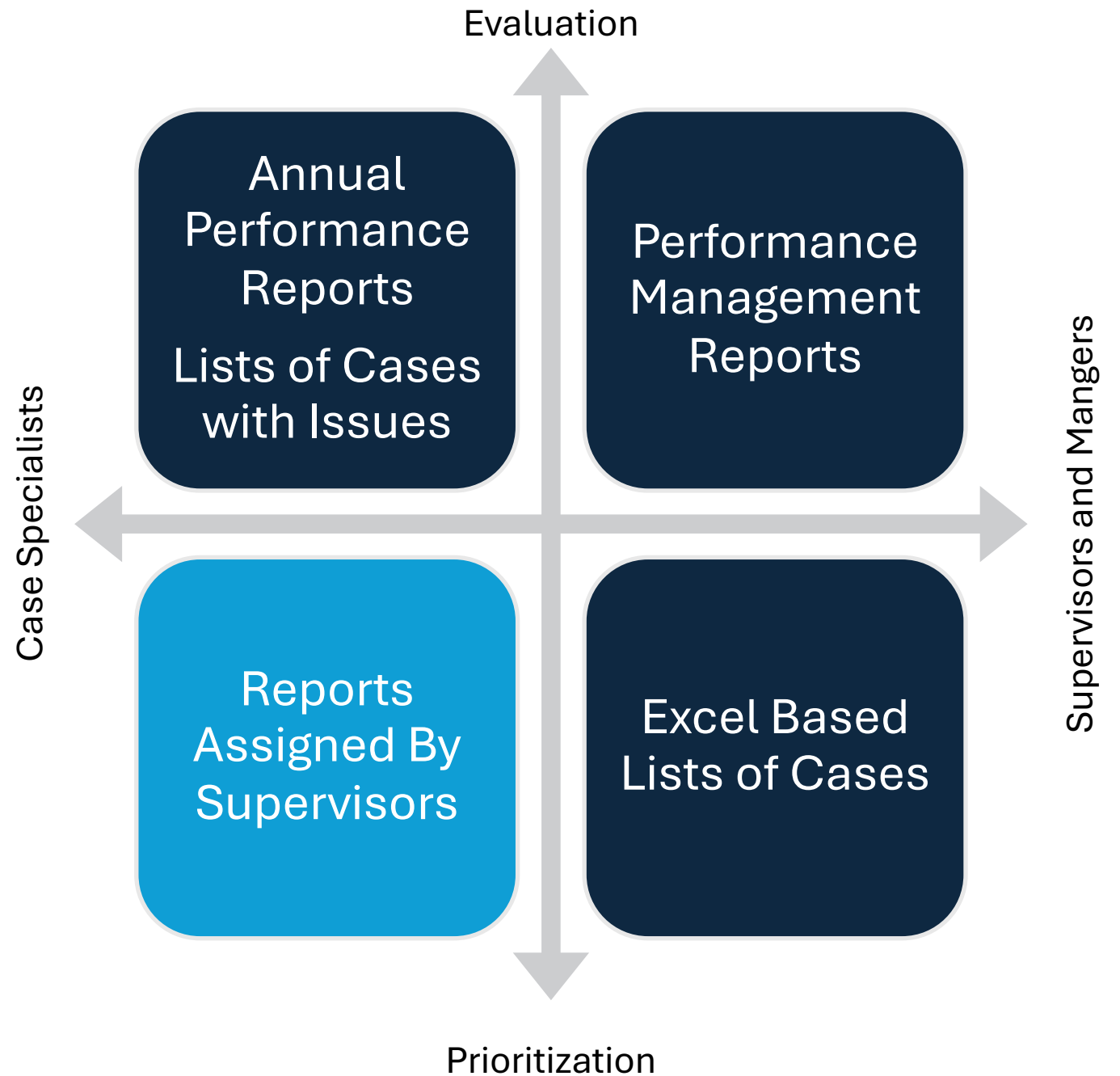
Building Data Capacity in Leadership



- Explicit training for leaders on tools and techniques for data work
- Data workers brought into planning work early in the process
- Exploratory projects to show potential of advanced analytics



Reporting Tools Analysis





Child Support Specialist Dashboard

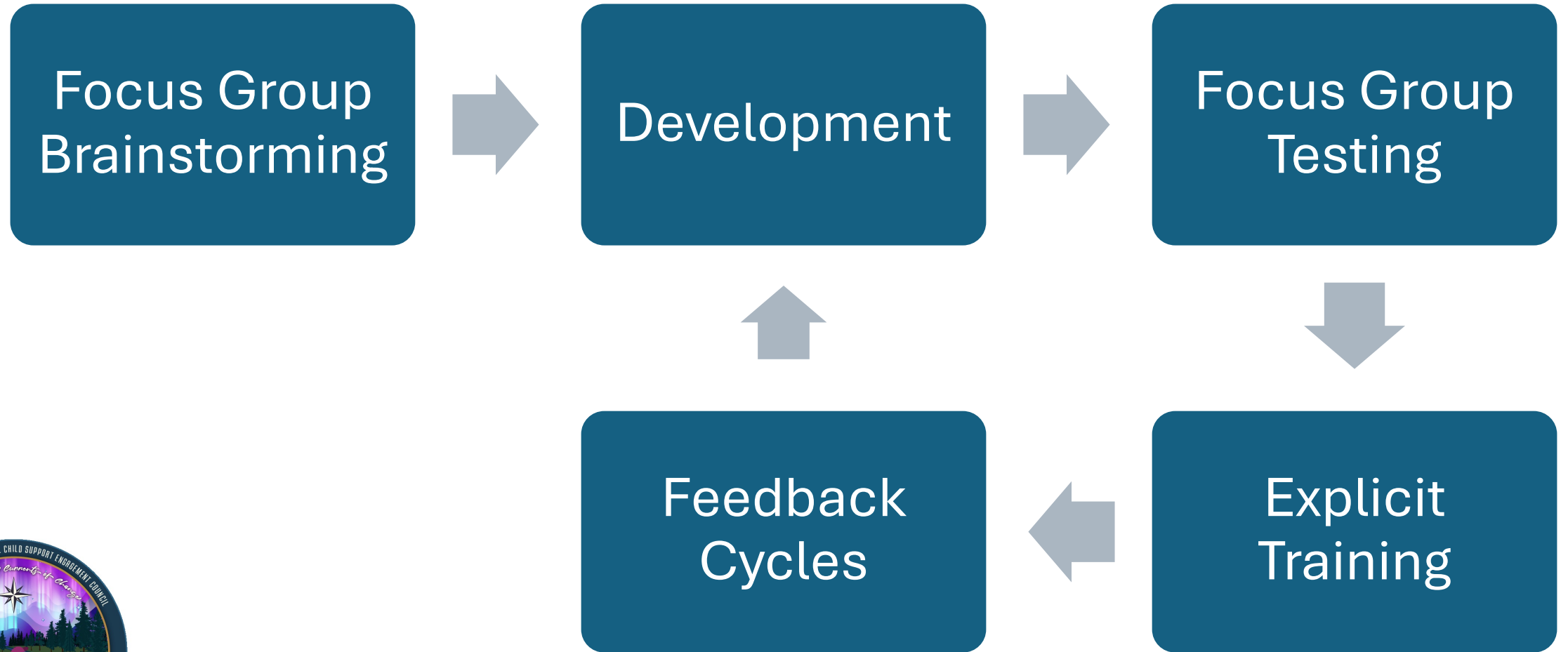
Need

- Provide function and team specific case level data
- Directly accessible by case specialists
- Leverage existing knowledge
- Low barrier for entry

Value

- Customized to teams and allow further refinement
- Prioritize categories and individual cases
- Reduce PRISM navigation time
- Utilizes aggregation and advanced analytics

Development Process



Potential Legal Process*i*

Data privacy:
Medium sensitivity

7/28/2025
Latest Refresh Date

Caseload

Break These Out By

PA Program

Show the name of ...

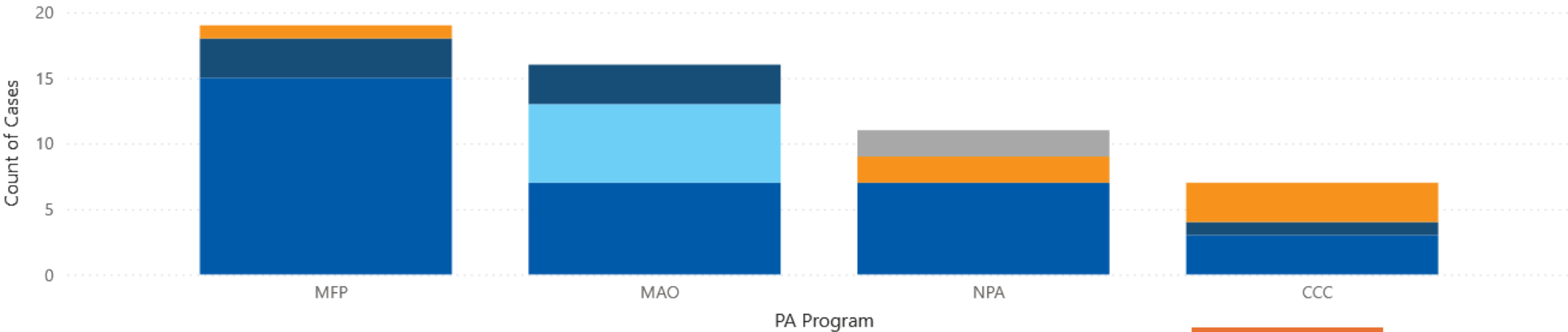
CPNCP

Pending Closure

NY

Count of Cases

Potential Legal Process ● Full Service MES ● Med Only MES ● MES Add-On ● R/C MES ● Unknown



TEAM/POS	ID_CASE	PA Program	Child Care	Case Open	Case Recieved	Pending Closure	Case Age (Months)	Function	CP Coop	Participant Role	Participant Name	Potential Legal Process	Ready For Pleadings Steps Complete
		MFP	N	9/17/2024	11/14/2024		8	OL	N	CP		Full Service MES	5
		MAO	N	12/2/2019	4/3/2025		3	EL	Y	CP		Med Only MES	5
		NPA	N	5/29/2024	7/1/2025		0	OL	Y	CP		Full Service MES	5
		MFP	N	6/28/2023	4/8/2025		3	LO	Y	CP		Full Service MES	4
		NPA	N	6/18/2024	7/1/2025		0	OL	Y	CP		Full Service MES	4
		NPA	N	2/22/2024	2/22/2024	7/27/2025	17	EL	N	CP		Full Service MES	3
		NPA	N	5/26/2022	4/8/2025	8/4/2025	3	ON	Y	CP		Full Service MES	3
		MAO	Y	6/2/2021	2/27/2024		17	ON	Y	CP		MES Add-On	3
		CCC	Y	5/20/2024	6/13/2025		1	ON	Y	CP		Full Service MES	3
		MAO	N	3/15/2024	7/1/2025		0	OL	Y	CP		Full Service MES	3

53
Number of Cases



Caseload Overview

Data privacy:
Medium sensitivity

7/28/2025

Latest Refresh Date

Caseload

Break These Out By ...

Function

Show the name of ...

CPNCP

Fields to Show

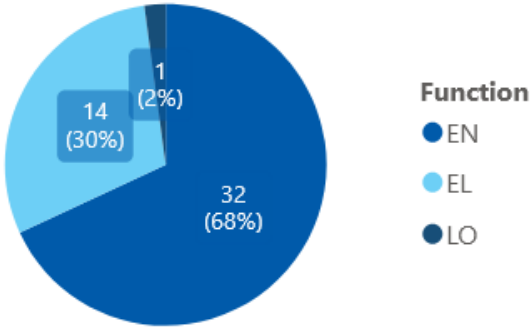
Ctrl + Click to Select Multiple

- Select all
- Child Care Case
- File Location
- Current Obligation
- Current CP Obligation
- Case Open
- Pending Close
- Most Recent Phone C...
- Most Recent Case Plan

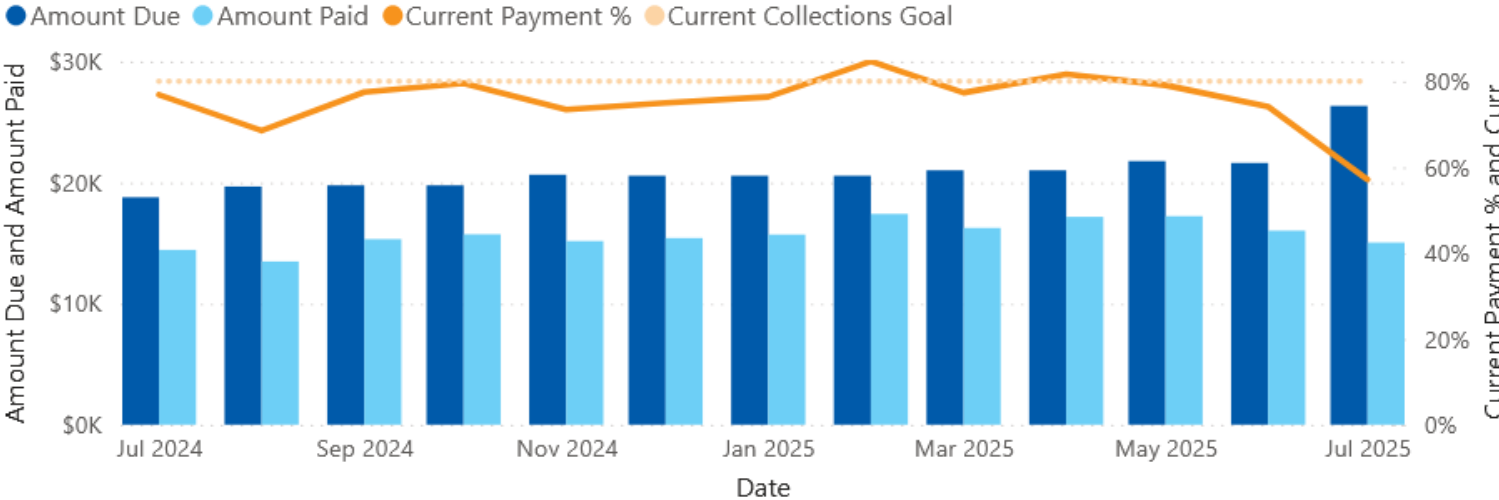
ResetAll

47

Number of Cases by Function



Current Due, Collected and Collection % by Month



TEAM/POS	ID_CASE	Participant Role	Participant Name	Case Open	Most Recent Payment	PA Program	Last Month Payment Status	Current Month Payment %	Current Payment Trend
		NCP		6/26/2018	7/25/2025	MAO	Full Payment	99.92%	↑ 15.40%
		NCP		3/4/2015	7/25/2025	MAO	Full Payment	100.00%	↗ 2.83%
		NCP		7/27/2011	7/25/2025	NPA	Full Payment	100.00%	→ 0.00%
		NCP		4/11/2005	7/25/2025	MAO	Partial > 50%	94.54%	↑ 41.04%
		NCP		12/21/2017	7/25/2025	NPA	Partial > 50%	92.29%	↗ 2.57%
		NCP		3/1/2019	7/25/2025	MAO	Partial > 50%	0.00%	↗ 3.64%
		NCP		1/6/2021	7/24/2025	NPA	Full Payment	100.00%	↑ 16.67%
		NCP		3/8/2023	7/24/2025	MAO	Full Payment	100.00%	↑ 83.33%
		NCP		12/9/2010	7/23/2025	NPA	Full Payment	94.34%	↗ 1.60%
		NCP		9/12/2019	7/23/2025	MFP	Full Payment	100.00%	→ 0.00%



Data privacy:	7/28/2025
Medium sensitivity	Latest Refresh Date

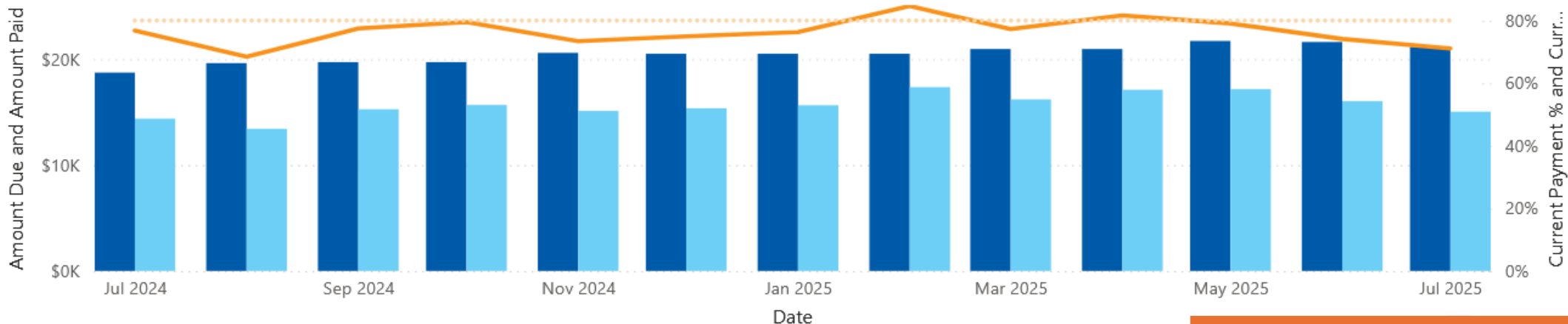
CP	NCP
----	-----

No Payment, Phone
Call, or Payment in 90
Days

Clear Filters

Number of Cases

● Amount Due ● Amount Paid ● Current Payment % ● Current Collections Goal



TEAM/POS	ID_CASE	PA Program	Func	Participant Role	Participant Name	Last Month Payment Status	Most Recent Phone Call	Most Recent Case Plan	Payment Timing	Payment Timing Variability	Payment Risk Level
		MFP	EL	NCP		Partial < 50%	4/21/2025	4/21/2025	Unknown	Very Irregular	8
		MAO	EN	NCP		Partial > 50%	6/28/2021	3/27/2024	Monthly	Somewhat Regular	5
		NPA	EL	NCP		Full Payment	5/10/2021	5/30/2024	Monthly	Somewhat Irregular	4
		MFP	EL	NCP		No Payment	9/26/2024	8/16/2024	Bi-Weekly	Very Regular	4
		NPA	EN	NCP		Full Payment	6/25/2021	7/25/2024	Bi-Weekly	Somewhat Regular	4
		NPA	EN	NCP		No Payment	1/30/2023	11/26/2024	Unknown	Very Irregular	4
		MAO	EN	NCP		Partial > 50%	5/20/2024	7/22/2024	Bi-Weekly	Somewhat Regular	4
		NPA	EL	NCP		No Payment	2/27/2025	2/5/2025	Unknown	Somewhat Regular	4
		MFP	EN	NCP		Partial > 50%	1/4/2019	6/28/2017	Bi-Weekly	Very Regular	4
		MFP	EN	NCP		Partial > 50%	1/4/2019	2/2/2023	Bi-Weekly	Very Regular	4
		MAO	EN	NCP		No Payment	6/26/2025	6/26/2025	Monthly	Monthly	4



Thank You!

Presenters:

Cheryl Carlson

Jeffrey Olson MBA

Peter J. Castro PhD. (abd)

Benjamin Taylor

cheryl.carlson@dcss.ca.gov

jeffrey.s.olson@state.mn.us

peter.castro@state.mn.us

benjamin.taylor@hennepin.us