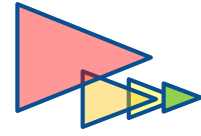


# Business Intelligence and Data Warehousing Technology Implementation

Reddy Gurram, IT Division Chief

# Business Intelligence



## Data Driven Decisions

- ▶ Sacramento embraced a collection of new business intelligence technologies and innovations to improve program management with data supported decisions.
  - ▶ **DASHBOARDS**- real time operational awareness of call centers and lobbies
  - ▶ **INTERACTIVE REPORTING**- rapidly available reporting with filters, slicers and drill downs to detailed records
- ▶ Business Intelligence is a tool set that can be used to provide relevant information in both real time and historical context.
- ▶ An example of Business Intelligence

# Data Rich... Information Poor

Too often, organizations are data rich and information poor due to their data residing in disconnected systems.

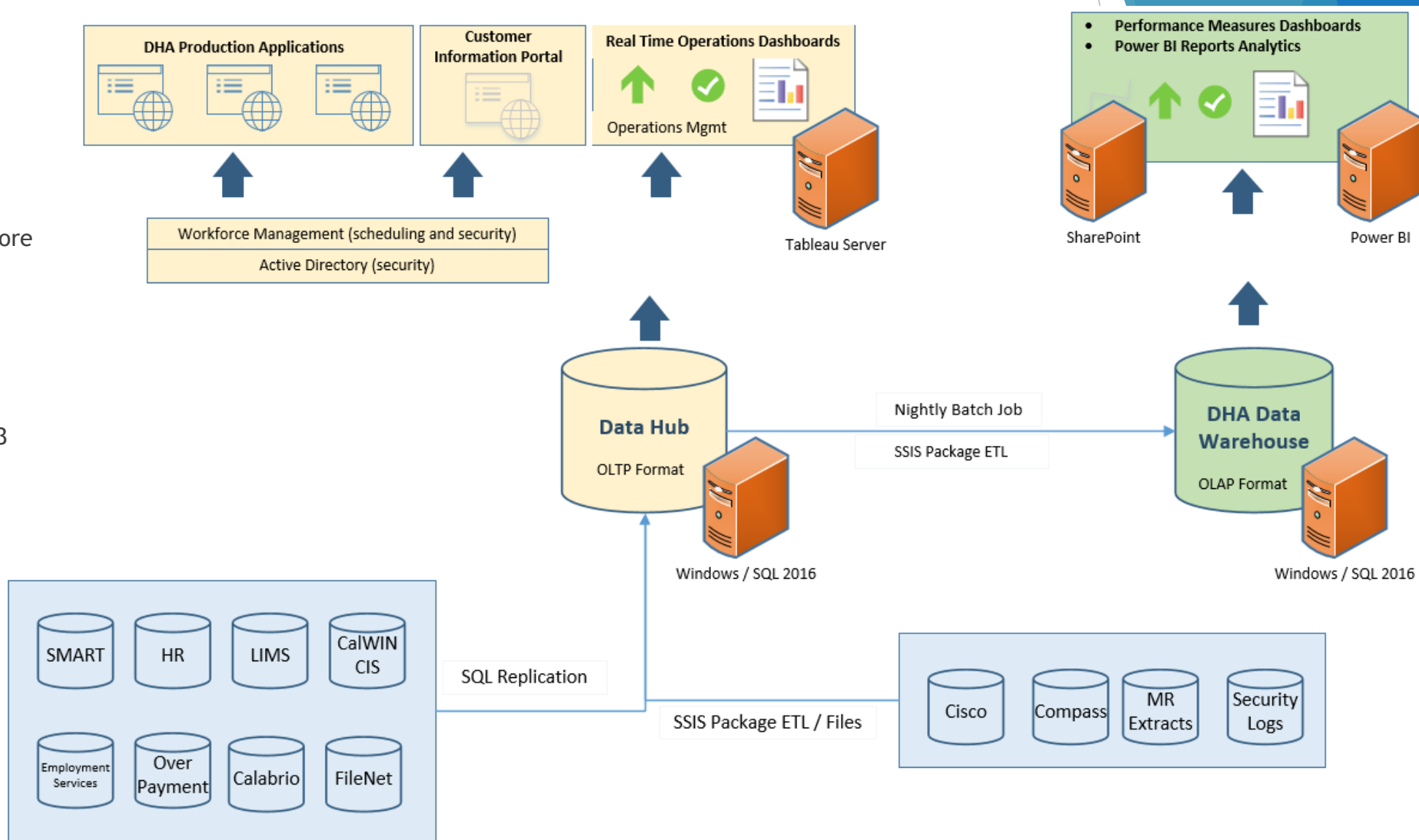
The adoption of a data warehouse and integrated analytics platforms like dashboards and data portals helped Sacramento County overcome this challenge.

# What makes Sacramento's BI possible?

- ▶ **DataHub** - A collection of real time (or near real time) data made available to applications and reports for operations level use. Data is merged from disconnected systems to produce relevant datasets.
  - ▶ Example: *Number of calls in progress that are conduction live phone appointments. Who is performing the call, how long is the call and what is the call status.*
- ▶ **Data Warehouse** -Aggregated data from disconnected systems transformed for detailed analysis and reporting. Maintains historical context of activity to track changes over time.
  - ▶ Example: Identify customers that have visited lobby locations immediately after missing phone appointments rather than calling to reschedule the appointment.
- ▶ **Server Infrastructure that can deliver real time visualizations and reports**
  - ▶ SQL Server 2016
  - ▶ Tableau
  - ▶ Power BI

# Architecture

- ▶ SQL Server 2016  
Physical Server, 16 core
- ▶ Tableau v10.5
- ▶ Power BI Server v5/2018  
2 VMs, 8 core each
- ▶ SharePoint  
(PerformancePoint) v2013



# Performance Measures

- ▶ SharePoint
  - ▶ Performance Point
- ▶ Scorecard Format
  - ▶ Historical records
  - ▶ Drill down to details
  - ▶ All DHA Program Measures
  - ▶ State/Federal Measures (WPR)
  - ▶ DHA Administration
  - ▶ Internal Investigations

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Human Resource
Operations Management

DHA Performance Dashboard - Staging

Medi-Cal Assistance Program

	Status	Actual	Trend	Target	Red-Line	Data Period	Details
Medi-Cal applications processed <= 45 days	🟡	93.6%	⬇️	95%	90%	Nov '15	<a href="#">Details</a>
Avg. days to complete intake (excluding CMISP & DED)	🟢	25.3	➡️	35	45	Nov '15	<a href="#">Details</a>
Avg. days to complete CMISP intake (excluding DED)	🟢	22.4	⬇️	35	45	Nov '15	<a href="#">Details</a>
Renewals processed <= 60 days	🔴	87.1%	➡️	95%	90%	Nov '15	<a href="#">Details</a>

CalWORKs

	Status	Actual	Trend	Target	Red-Line	Data Period	Details
Immediate need determined within 1 day	🟢	97.2%	➡️	96%	90%	Jan '16	<a href="#">Details</a>
Average days to determination of intake	🟢	7.0	⬇️	10	15	Nov '15	<a href="#">Details</a>
Applications processed within 45 days	🟢	98.2%	➡️	95%	90%	Nov '15	<a href="#">Details</a>

CalFresh

	Status	Actual	Trend	Target	Red-Line	Data Period	Details
ES granted within required 3-day time frame	🟢	98.1%	➡️	97%	90%	Jan '16	<a href="#">Details</a>
Avg calendar days to disposition	🟢	9.4	➡️	14	17	Dec '15	<a href="#">Details</a>
Applications disposition <= 30 days	🟢	98.5%	➡️	95%	90%	Dec '15	<a href="#">Details</a>
CalFresh FFY cumulative error rate	🟢	0.00%	⬇️	4%	5%	Feb '15	<a href="#">Details</a>

Medi-Cal/CalFresh Service Center

	Status	Actual	Trend	Target	Red-Line	Data Period	Details
All Incoming Calls - Average Speed of Answer Calls	🔴	00:02:20	⬆️	00:01:00	00:02:00	Jan '16	<a href="#">Details</a>

Employment Services

	Status	Actual	Trend	Target	Red-Line	Data Period	Details
Count of clients who gained employment (monthly)	🟢	601	⬇️	305	275	Sep '15	<a href="#">Details</a>
Clients no longer in receipt of CalWORKs after 90 days of employment	🟢	41.3%	➡️	25%	20%	Dec '15	<a href="#">Details</a>
Federal WPR (FFY 2015)	🟢	51.5%	⬆️	50%	45%	Sep '15	<a href="#">Details</a>

Federal WPR - Year/Month Comparison

	Previous	Latest	Status
Federal WPR - Data Period	Sep '14	Sep '15	
Federal WPR - Value	46.8%	51.5%	⬆️

Stage One Child Care

	Status	Average	Trend	Target	Red-Line	Data Period	Details
Avg Days to Process Paid Claims(CCPU to DOF)	🟢	18.0	⬆️	20	24	Jan '16	<a href="#">Details</a>

General Services

	Status	Actual	Trend	Target	Red-Line	Data Period	Details
Positive response to 6 Customer Satisfaction Questions	🟡	85.4%	⬇️	90%	85%	Jul-Dec '14	<a href="#">Details</a>

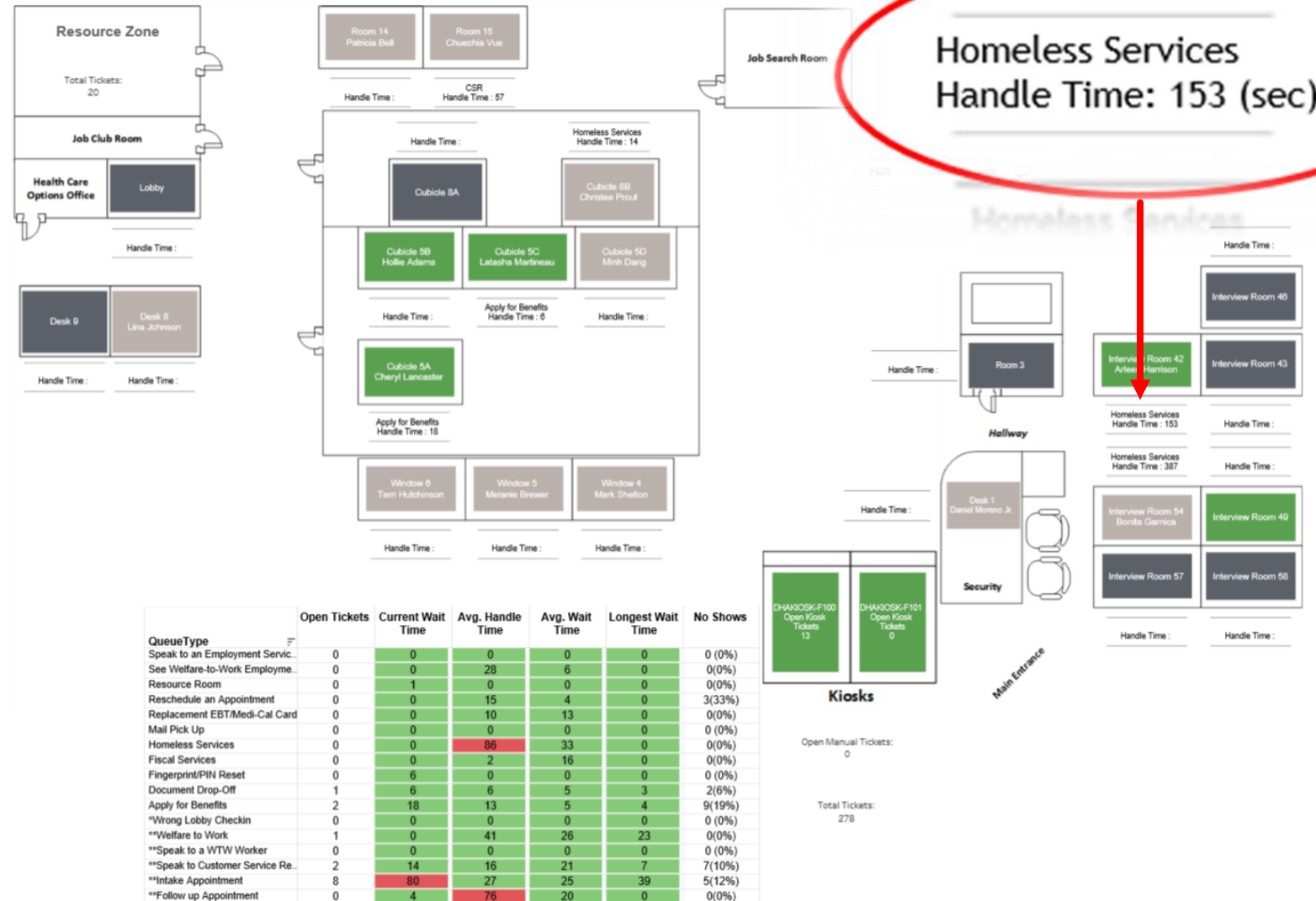
Notes
Please edit this page to add your comments

# Performance Measures - Scorecard (Queue Items)

	Total	Processed	Staff Ratio	Avg Handle Time	Status	Avg Wait Time	Status	Avg Overall	Status
▲ Queue Items	2,344	2,341	111.48	15	●	330	◆	24	●
Apply for Benefits	408	408	34.00	23	●	11	●	34	●
Document Drop-Off	708	708	54.46	10	●	8	●	18	●
Fingerprint/PIN Reset	18	18	3.60	29	◆	17	▲	46	◆
Fiscal Services	2	2	2.00	4	●	10	●	15	●
Follow up Appointment	3	3	1.50	28	●	11	●	39	●
Homeless Services	43	43	3.91	35	▲	25	▲	59	▲
Mail Pick Up	1	1	1.00	3	●	6	●	9	●
Replacement EBT/Medi-Cal Card	211	211	19.18	8	●	9	●	17	●
Reschedule an Appointment	15	15	3.00	22	◆	7	●	29	●
Resource Room	1	1	1.00	0	●	2	●	2	●
See Welfare-to-Work Employment Advisor	48	48	6.86	7	●	18	●	25	●
Speak to an Employment Services Worker	7	7	1.75	12	●	22	●	33	●
Speak to Customer Service Representative	807	806	67.17	13	●	338	◆	19	●
Welfare to Work	4	4	2.00	2	●	44	◆	46	●

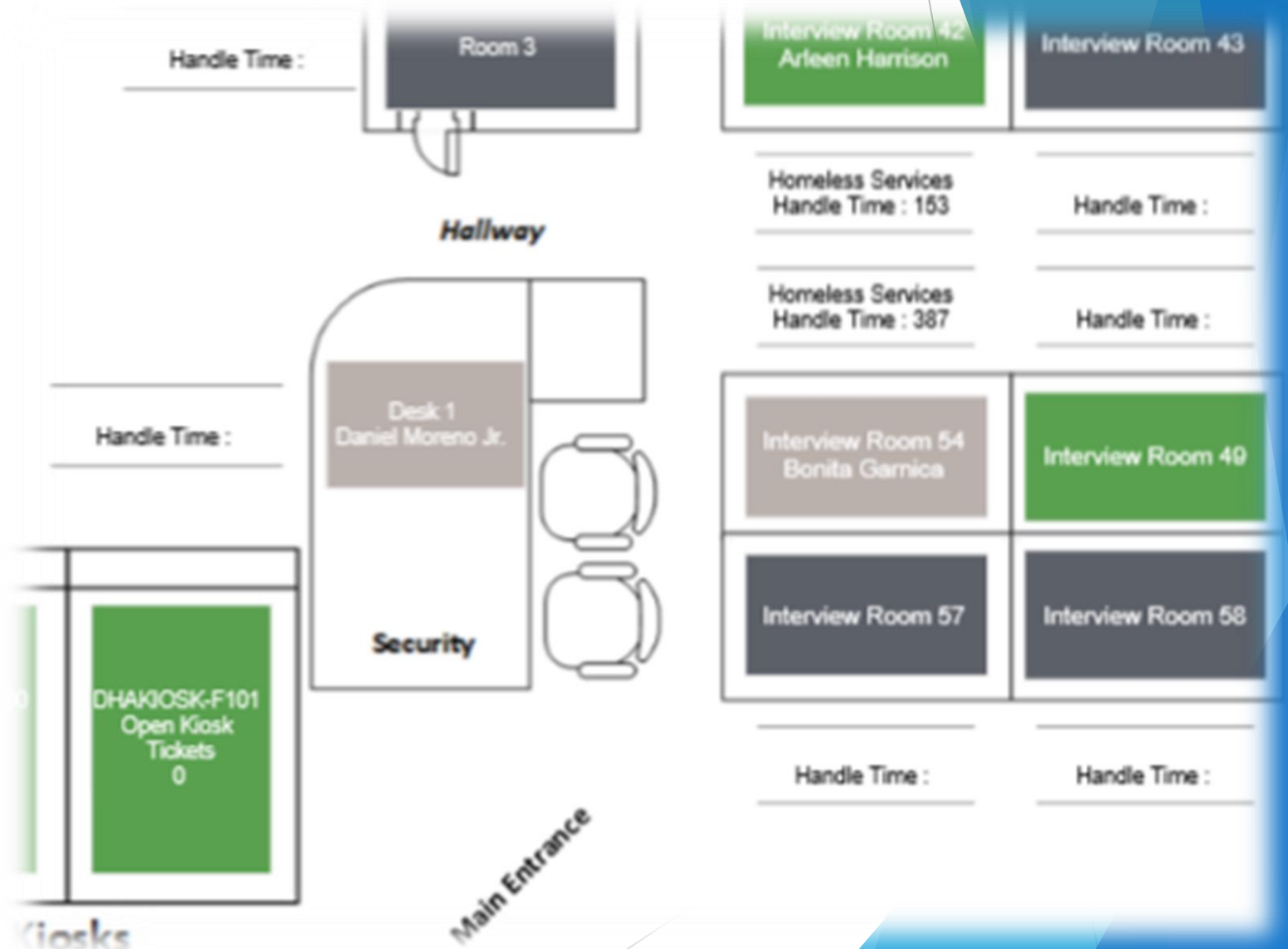
# Real Time Operations Management Lobby Dashboard

- ▶ Real Time
- ▶ Tableau
- ▶ Visual layout of each lobby
- ▶ Predicted Wait Times
- ▶ Lobby Kiosk Check Ins
- ▶ Appointments
- ▶ Window status
- ▶ Service Time
- ▶ Non-Active resources
- ▶ Averages and Thresholds
- ▶ Wrong Lobby Alerts





# Lobby Dashboards - Unique version for each lobby



# Real Time Operations Management Service Center Dashboard

- ▶ Real Time
- ▶ Tableau
- ▶ Call Queue status
- ▶ Number of Calls Waiting
- ▶ Wait Times
- ▶ Handle/Talk Times
- ▶ Call Center Agent status

- Calls
- Appointments
- Schedule
- Assigned Tasks
- Unassigned Tasks

Color Group	Language	Calls Waiting In Q	Longest Call Waiting In Q	Not Ready Scheduled	RONA	Ready
28th GI	English	3	2	0	0	0
28th Rescheduled	English	0	0	0	0	0
Blue	English	0	0	7	0	21
	Russian	0	0	2	0	0
	Spanish	0	0	1	0	4
E Comm Rescheduled	English	0	0	0	0	1
Gold	English	0	0	2	0	6
	Spanish	0	0	0	0	1
Grey	English	0	0	0	0	0
Pink	English	0	0	0	0	1
Silver	English	0	0	2	0	6
	Russian	0	0	0	0	0
	Spanish	0	0	0	0	1
Teal	English	0	0	0	0	2
Yellow	English	2	7	3	0	0
	Spanish	0	0	1	0	0

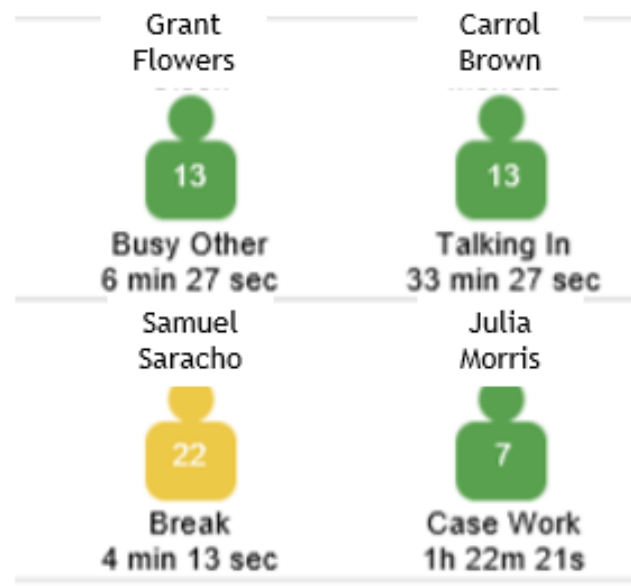
- Color
- (All)
- Blue
- Gray
- Red
- Yellow
- Green



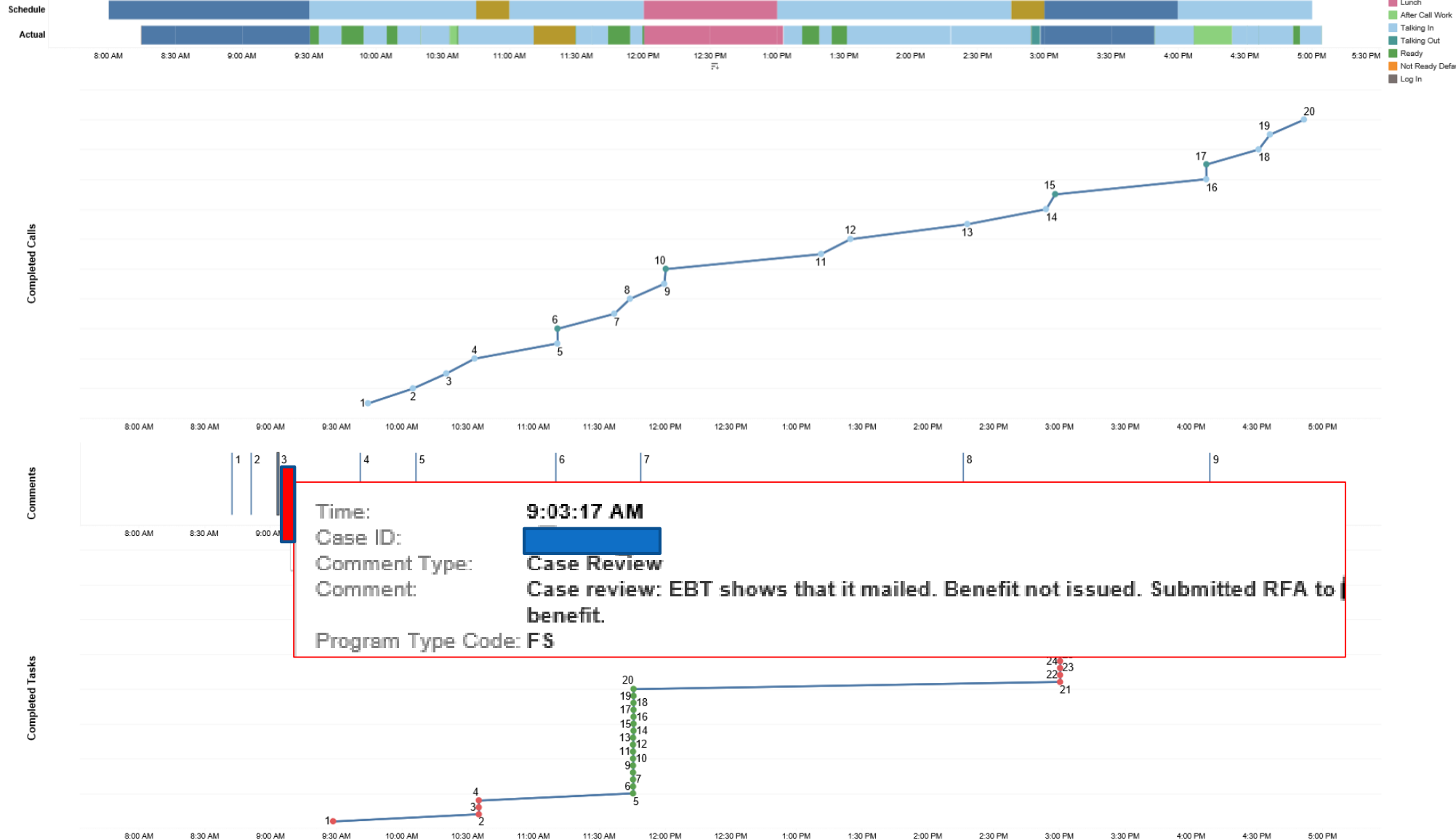
Chesnokov				
Angelica Rivas				
Anna Morales				
Anthony Santos				
Bao Tang				

## Service Center Dashboard - Real time statuses

Color Group	Language	Calls Waiting In Q	Longest Call Waiting In Q	Not Ready Sct
28th GI	English	3	2	0
28th Rescheduled	English	0	0	0
Blue	English	0	0	7
	Russian	0	0	2
	Spanish	0	0	1

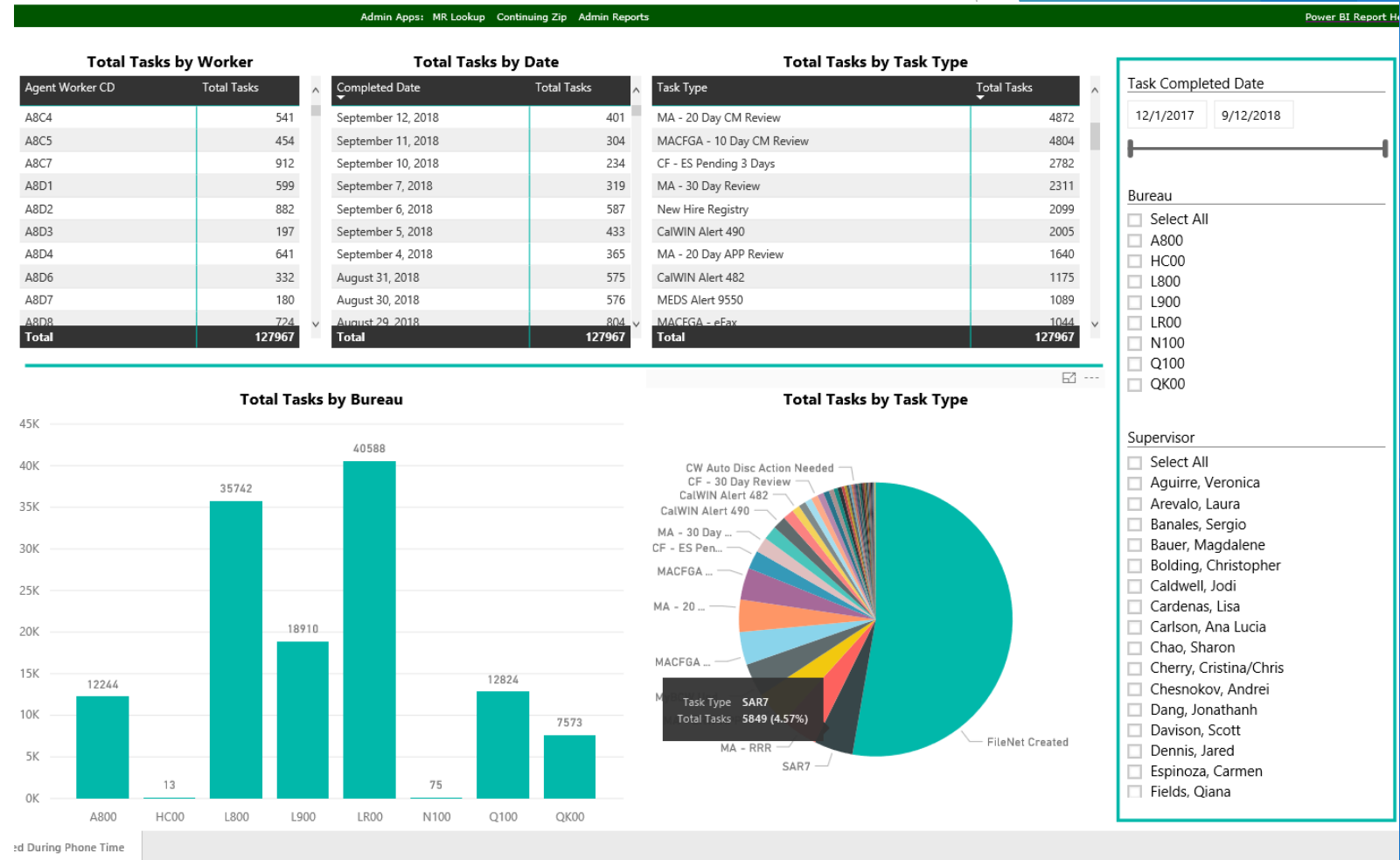


# Service Center Dashboard - Agent activity/ history



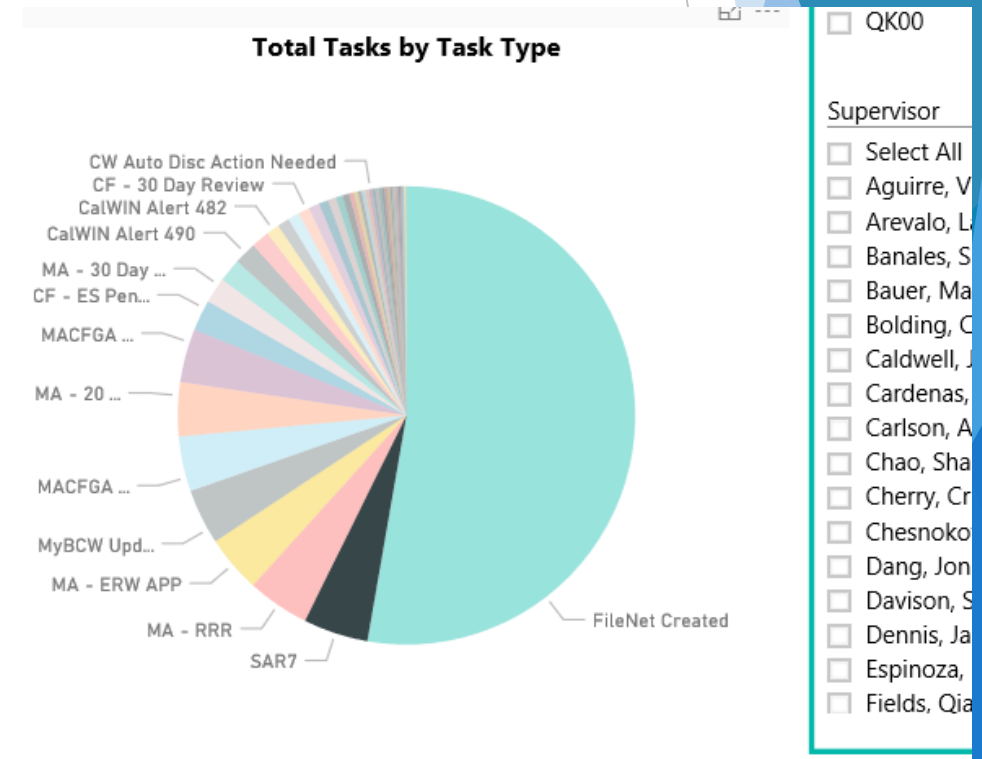
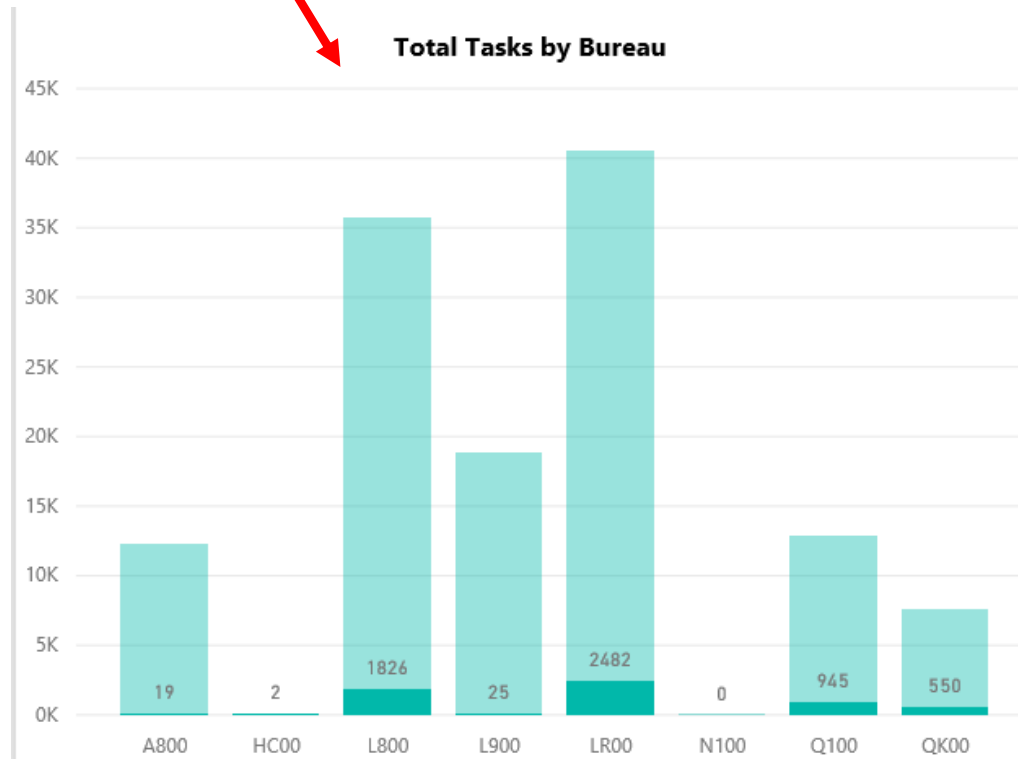
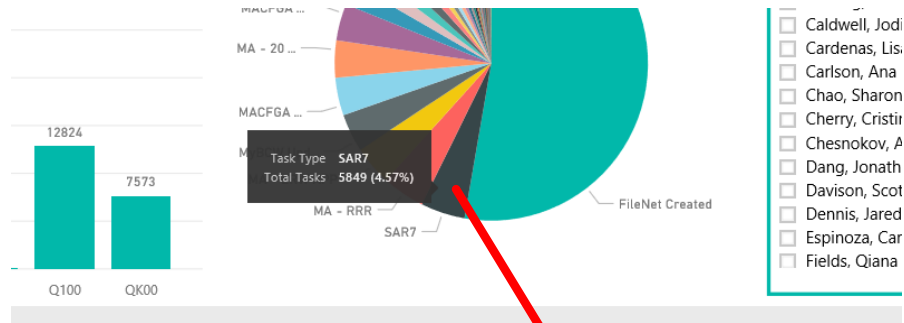
# Interactive Reporting Power BI

- ▶ Allows exploration of data with filters, slicers and visual comparisons
- ▶ Self Service Reporting available with large data sets (Direct Query connection to SQL server)
- ▶ Drill down to detailed records
- ▶ Rapid report development from curated data sets (Data Warehouse)
- ▶ Sacramento migrating legacy reports to new Power BI platform



# Power BI -

## Interactive filters for self-service reporting



# Power BI -

## Interactive filters for self-service reporting



### SHINE 1 - EFS Reservations- where Client slept previous night per EFS question responses

Monthly Count of Reservations by CREATE DATE

Create Date Month	ACCEPTED	ACCEPTED SHELTER	ACCEPTED SHELTER WITH NEXT MOVE	ACCEPTED SHELTER WITH VOA	ALREADY MOVED INTO APT	DISQUALIFIED	DIVERSION	DUPLICATE	FLEEING FELON	NO CONTACT	Not Disposition
3	1	1	5	4	2	7		2		2	
4			2	5		5		4		1	
5			3	6		4		3			
6			3		1	2		1			
7			1	1		2		3			
<b>Total</b>	<b>30</b>	<b>14</b>	<b>41</b>	<b>48</b>	<b>77</b>	<b>83</b>	<b>17</b>	<b>166</b>	<b>1</b>	<b>48</b>	<b>1</b>

Reservation Create Date

10/2/2017

9/12/2018

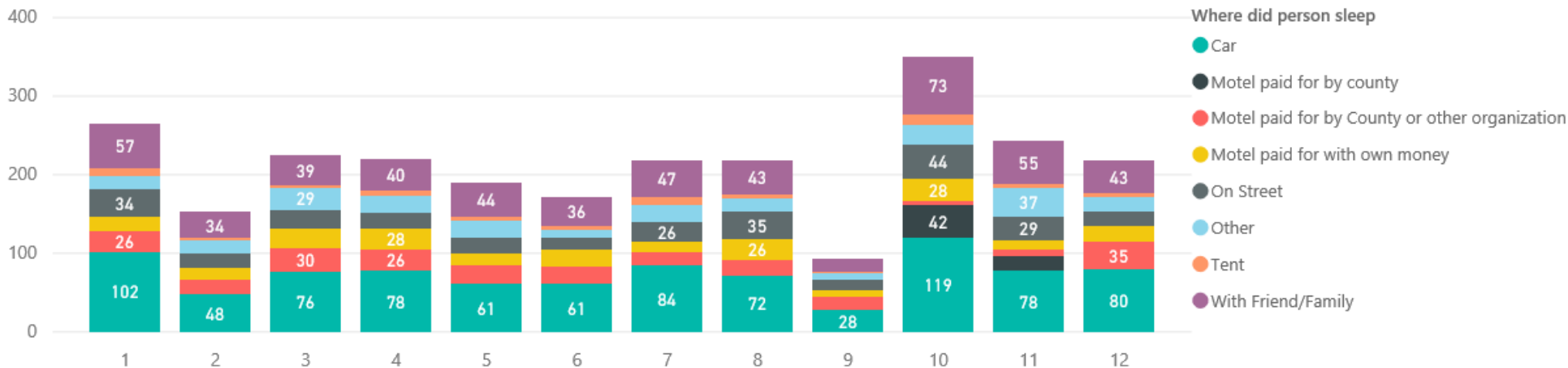
IsCWActive

☐ False

☐ True



CasID by Create Date Month and Where did person sleep



DispositionDescription

- ☐ ACCEPTED
- ☐ ACCEPTED SHELTER
- ☐ ACCEPTED SHELTER WITH NEXT MOVE
- ☐ ACCEPTED SHELTER WITH VOA
- ☐ ALREADY MOVED INTO APT
- ☐ DISQUALIFIED
- ☐ -----

Where did person sleep

- ☐ Car
- ☐ Motel paid for by county
- ☐ Motel paid for by County or other...
- ☐ Motel paid for with own money

# Power BI -

## Results change with selections



### SHINE 1 - EFS Reservations- where Client slept previous night per EFS question responses

Monthly Count of Reservations by CREATE DATE



Create Date Month	ACCEPTED	ACCEPTED SHELTER	ACCEPTED SHELTER WITH NEXT MOVE	ACCEPTED SHELTER WITH VOA	ALREADY MOVED INTO APT	DUPLICATE	NO CONTACT	Not Dispositioned	REFUSED	STAYING WITH FAMILY DO NOT NEED FAMILY SHELTI
3		1	2	1	1				1	1
4									3	
5					2				2	
6									2	
7									1	
<b>Total</b>	<b>4</b>	<b>1</b>	<b>6</b>	<b>7</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>26</b>	<b>5</b>	

Reservation Create Date

10/2/2017

9/12/2018

IsCWActive

☐ False

☒ True

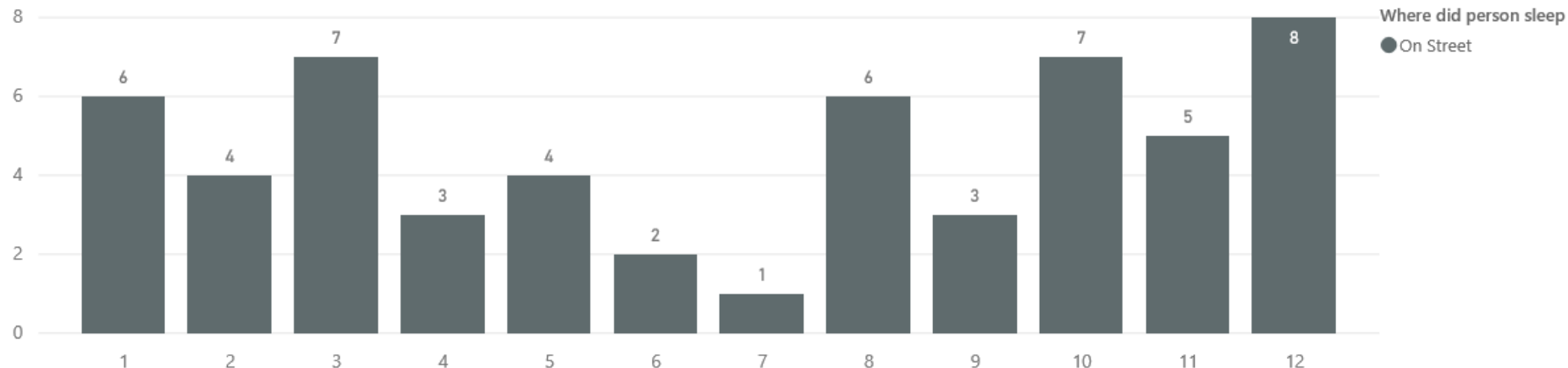
DispositionDescription

- ☐ ACCEPTED
- ☐ ACCEPTED SHELTER
- ☐ ACCEPTED SHELTER WITH NEXT MOVE
- ☐ ACCEPTED SHELTER WITH VOA
- ☐ ALREADY MOVED INTO APT
- ☐ DUPLICATE

Where did person sleep

- ☐ Other paid for with own money
- ☒ On Street
- ☐ Other
- ☐ Tent
- ☐ With Friend/Family

CasID by Create Date Month and Where did person sleep



CasID LastName FirstName DateOfBirth Is CW Active Where did person sleep BGC Status Description Disposition Description Phone Email



## Key Take Away #1

**Data warehousing creates availability of information and opportunity to integrate data sets with real time processes**

**Example:** Sacramento's Customer Information Portal (CIP) web application.

- ▶ 360 view of the case informs workers of upcoming appointments, tasks, documents returned, call history and case requirements in a single page with easy to use detail controls.
- ▶ Data that would normally be discovered through log in and searches in many systems is consolidated in the DataHub and returned in just seconds.
- ▶ Alerts, reminders and activity flags help guide workers to the most important details.

## Key Take Away #2

### Embrace data and analytics as a culture

Sacramento has transformed its reporting culture to leverage centralized, curated data for its reporting and analysis needs.

- ▶ DataHub is a unified, curated, and real time data store
- ▶ Data consumers are able to quickly find
- ▶ Business units empowered with “Big Picture” awareness of operations data that was previously too complex to blend.

## Key Take Away #3

### Real time data empowers decision making and rapid process reengineering

- ▶ Real time data dashboards display a simple graphical format layered throughout the visuals to provide both summary and detail information.
- ▶ Call center dashboards indicate the status of phone queues, call center agents, groups and critical business functions.
- ▶ Appointment scheduling and lobby/visitor data is displayed in a familiar graphical format using maps of the various facility lobbies.
- ▶ Schedule and workload are managed more effectively using the real time summary of entire workforce, while permitting the drill down to details in analysis and troubleshooting.

## Key Take Away #4

### Cost effectiveness

Sacramento County's Business Intelligence initiatives were developed within the existing database and server infrastructure of the department. The costs were limited to staffing resources of IT employees for a period of one year.

- ▶ Datasets and analytics tools promote rapid report development, greater access to information by business units and reduced security and performance risks.
- ▶ Hundreds of man hours saved per year in the basic administration and curating of the data.
- ▶ Unified reporting and analysis platform has saved an estimated 1000 hours of research and development time among reporting and solution support units in a single year.
- ▶ Some projects have experienced development times reduced by 50%.