



Improving Testing Throughput at a Public Laboratory

Colorado Department of Public Health and Environment

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Situation

Colorado Department of Public Health and Environment leaders sought to ensure that the Newborn Screening Program (NSP) administered in the State Laboratory had the appropriate level of personnel with the required skills to perform the workload and improve overall engagement successfully and sustainably. Newborn screening is a set of tests that check screen samples from newborn babies for various conditions that may be treated if found early. Colorado is a two-screen state, meaning every child is screened twice: once at 24-48 hours of life and once between 8-14 days of life. The Department called on GPS to perform an in-depth workload analysis and provide recommendations to improve and potentially expand operations.

Approach

GPS developed a four-phase approach that included extensive interactions with laboratory staff, leadership, and physical walkthroughs. Categorizing all activities into job families enabled the team to collect and analyze data efficiently. Gathering broad input from employees via facilitated panels designed around job families was critical to the ultimate acceptance of the process and final recommendations. GPS' four-phase approach included the following four phases:

Phase 1: Identified staff resources and their depth of experience and expertise in the specific job families.

- Considered and gained consensus on the percentage of their work week involved with the job families as a proxy for their expertise.
- Created a crosswalk of team members and associated skills/job families and identified the subject matter experts (SMEs) invited to participate in subsequent analysis activities, ensuring the right individuals provided the details of the work performed across the entire spectrum of tasks.

Phase 2: Facilitated 18 separate panel interviews, ranging from 1-3 hours each, with 3-5 SMEs representing each job family to collect detailed data and perform in-depth workload analysis.

- Documented each family's primary activities, including specific estimates of monthly volumes, process time, and the accuracy of the inputs and processes. This data was captured into GPS' Workload Analysis and Balancing tool.
- Confirmed the data, including the calculated hours of availability, to ensure reasonable reflection of onsite staff resources able to process samples.
- Distinguished daily/monthly activities that would (or would not) increase with additional process volume.
- Validated the input with follow-up conversations and/or direct observations where ambiguity remained high.
- Documented recommendations and implementation plan.



Phase 3: Reviewed processes, operations, strategic plan, metrics, etc.

- Identified basic process steps and milestones encountered by customers and employees.
- Consulted with other teams that may be involved to collect perspective and input.

Phase 4: Elicited top challenges, pain points, and potential solutions based on perception of the process flow.

- Discussed potential innovation opportunities that could reduce wait or processing times, improve transparency, consistency, and flow, and mitigate risks.

Results

With broad participation and extensive data collection, GPS produced a workload model demonstrating the staffing level required for each job family and the aggregate staffing level to support the overall program. The directed Full-Time Equivalent resource projections (in green font in the image below) matched current staffing levels at the State Laboratory and identified areas to augment resources to meet changes in demand for blood spot screenings.

Workload Analysis CDPHE Laboratory Services Division								
BUSINESS UNIT: Newborn Screening Program (NBS)		138,000					TOTAL HRS/MO	AVAIL. FTE HRS/MO
JOB FAMILY: ALL							168	149.94
#	JOB FAMILY	PROCESS TIME (MINUTES)	RAW REQUIRED HOURS	RAW REQUIRED FTE	AVE. EST. ERROR RATE	ERROR ADJUSTED REQUIRED MIN	ERROR ADJUSTED REQUIRED HOURS	ERROR ADJUSTED REQUIRED FTE
1	Education & Outreach	18,555	180	1.2	5.5%	18,575	185	1.2
3	Courier	133	26	0.2	8.5%	139	28	0.2
4	Mail & Punch	103	463	3.1	9.4%	112	532	3.5
5	Accession	5	602	4.0	0.4%	5	604	4.0
6	Mass Spec	964	118	0.8	4.9%	1,002	125	0.8
7	GSP - Genetic Specimen/Screen Processo	1,165	184	1.2	10.6%	1,377	200	1.3
8	IEF - Isoelectric Focusing	579	182	1.2	1.9%	597	188	1.3
9	HPLC - High Pressure Liquid Chromatogr	397	116	0.8	10.9%	459	129	0.9
10	Victor - GALT, PKU. Bios	790	162	1.1	5.9%	905	172	1.1
11	Molecular	521	98	0.7	6.0%	560	104	0.7
12	Reporting	10,557	515	3.4	7.4%	10,683	524	3.5
13	Retention	75	2	0.0	0.0%	75	2	0.0
14	Fiscal	24,815	290	1.9	2.6%	25,695	305	2.0
15	IT & Vendor	97,570	188	1.3	0.0%	97,570	188	1.3
All	All	156,229	3,125	20.84	5.3%		3,286	21.9

Using the time-per-process data, GPS created a matrix of roles and calculated the base FTE need per role (e.g., Lab Tech, Scientist, IT, etc.) to help inform current and future operations.

GPS modeled the workload required to screen up to 5 additional conditions in the future. With the confidence gained from the model, leadership understood the incremental staff requirements. As a result, the program is now eliciting formal public feedback on the expanded screening potential of the (3) following conditions for population-wide newborn screening for infants born in Colorado:

Finally, the leadership team and NSP staff evaluated and addressed recommendations to improve overall performance based on input from the effort.