

Improving Efficiency within the Regional Tissue Bank (RTB)

1. Problem Definition

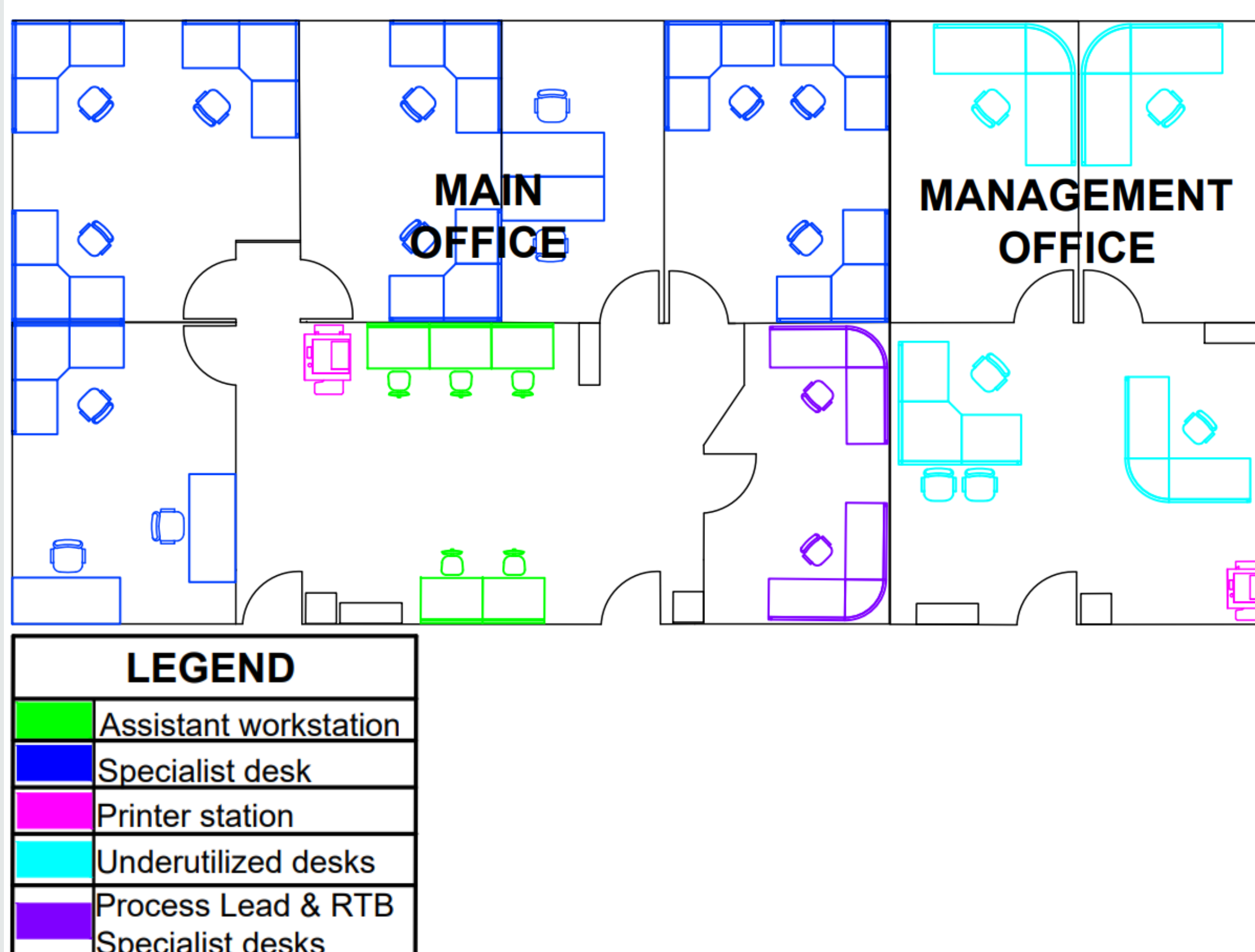
The RTB has had a 118% increase in the number of referrals, which requires more employees on site. However, the current space cannot accommodate any additional employees. Also, with the increased workload the employees are experiencing burnout.

2. Project Scope

- Find an optimal scheduling model for specialists and assistants
- Design new office layout and assistant workstation to make space for additional employees

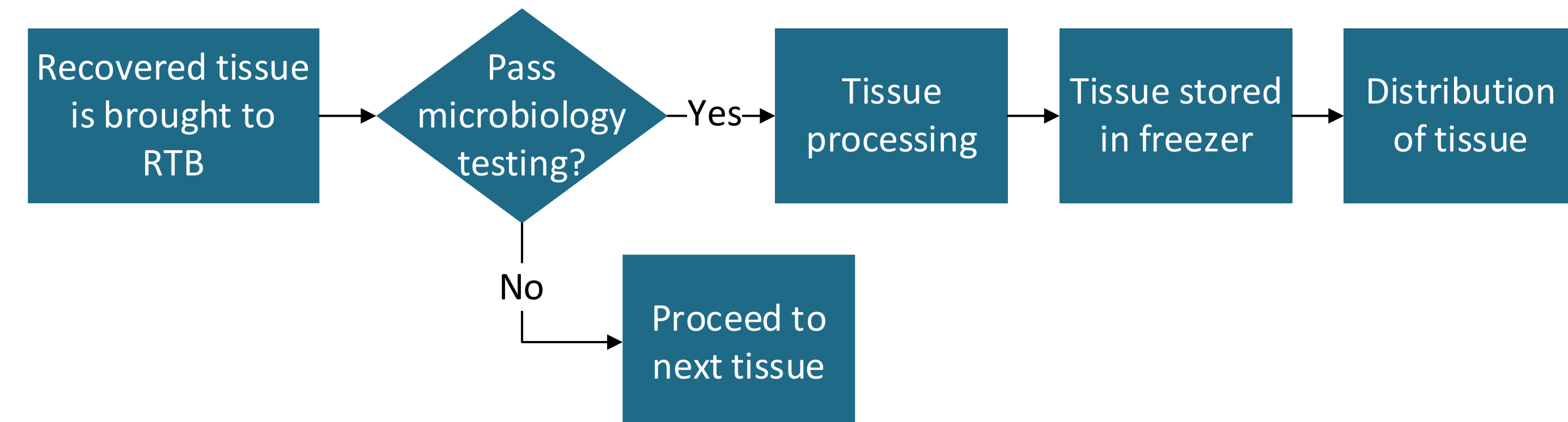
3. Current State

- Current Scheduling
 - Current Staffing Model: 10 specialists, 1 bone marrow specialist and 6 assistants
 - Schedule prepared manually every month
 - 8-hour shifts, 2 shifts per day
 - Weekend shifts consist of on-call and overtime hours
- Current Office Layout
 - 5 assistant workstations and 13 specialist desks
 - Underutilized space in Management Office



4. Methods & Analysis

Process Map



- Visual representation of overall process from tissue recovery to distribution
- Used to identify improvement areas

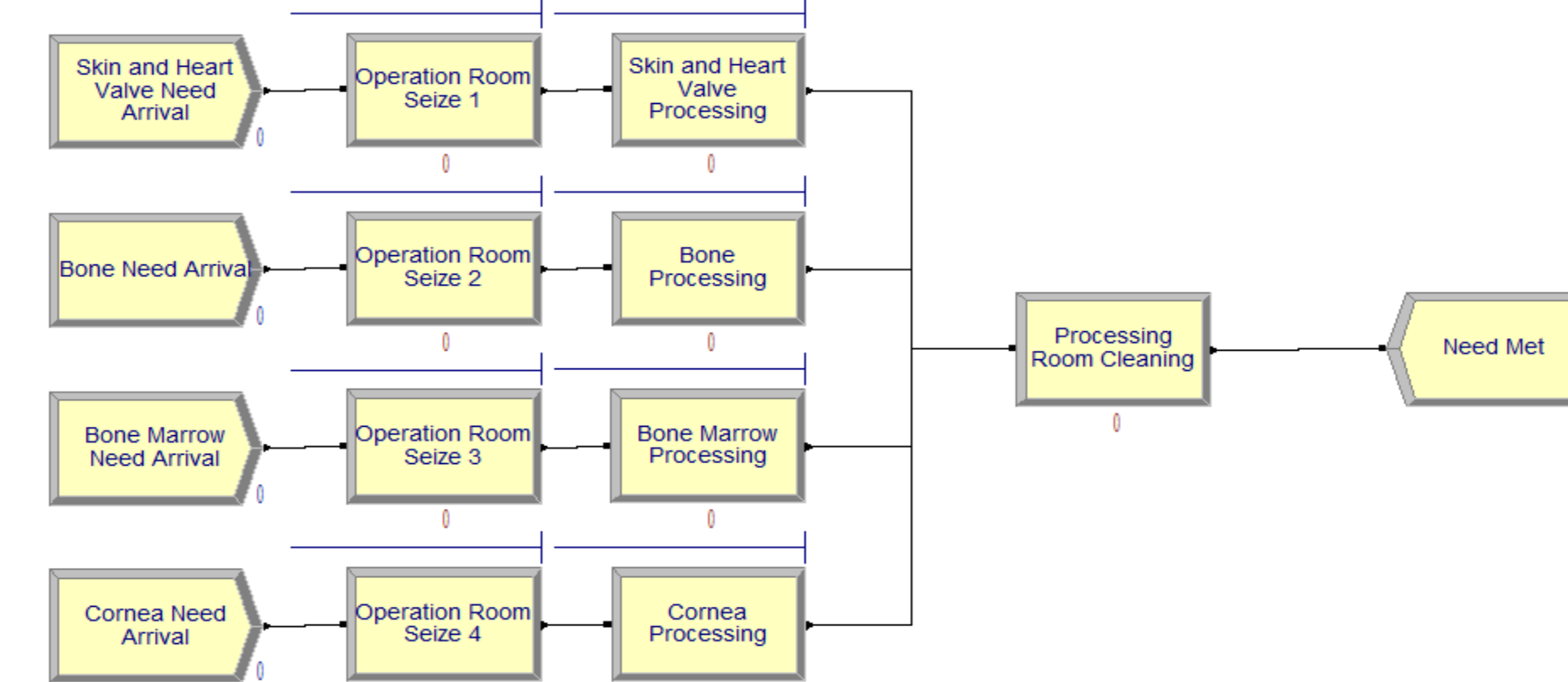
Sample section of process map

Office Layout Solution Options

- Developed 4 solution options
 - Evaluated each option
 - Compared designs
 - Selected best solution
- Researched ergonomic friendly desks, office chairs and storage options for assistants

Simulation Model

Purpose: To determine the number of employees required for tissue processing procedures



Off-Day Scheduling Model

Purpose: To optimize employee shift scheduling considering additional employees

Assumptions:

- 16 workers (n) per day, 7 days a week with a 5 day work stretch
- Each worker must be given 2 off-days per week
- 3 worker types (m): specialists, bone marrow specialists and assistants
- Each worker must be given A out of B weekends of for any A and $B, A < B$

Algorithm Using $A/B = 2/7$

	1	M	T	W	R	F	S	2	M	T	W	R	F	S	3	M	T	W	R	F	S	4	M	T	W	R	F	S	5	M	T	W	R	F	S	6	M	T	W	R	F	S	7	M	T	W	R	F	S
Worker 1	X					X	X							X	X																X																		
Worker 2						X	X							X	X															X	X																		
Worker 3						X	X							X	X														X	X																			
Worker 4						X	X							X	X														X	X																			
Worker 5						X	X							X	X														X	X																			
Worker 6						X	X							X	X														X	X																			
Worker 7						X	X							X	X														X	X																			
Worker 8						X	X							X	X														X	X																			
Worker 9						X	X							X	X														X	X																			
Worker 10						X	X							X	X														X	X																			
Worker 11						X	X							X	X														X	X																			
Worker 12						X	X							X	X														X	X																			
Worker 13						X	X							X	X														X	X																			
Worker 14						X	X							X	X														X	X																			
Worker 15						X	X							X	X														X	X																			
Worker 16						X	X							X	X														X	X																			

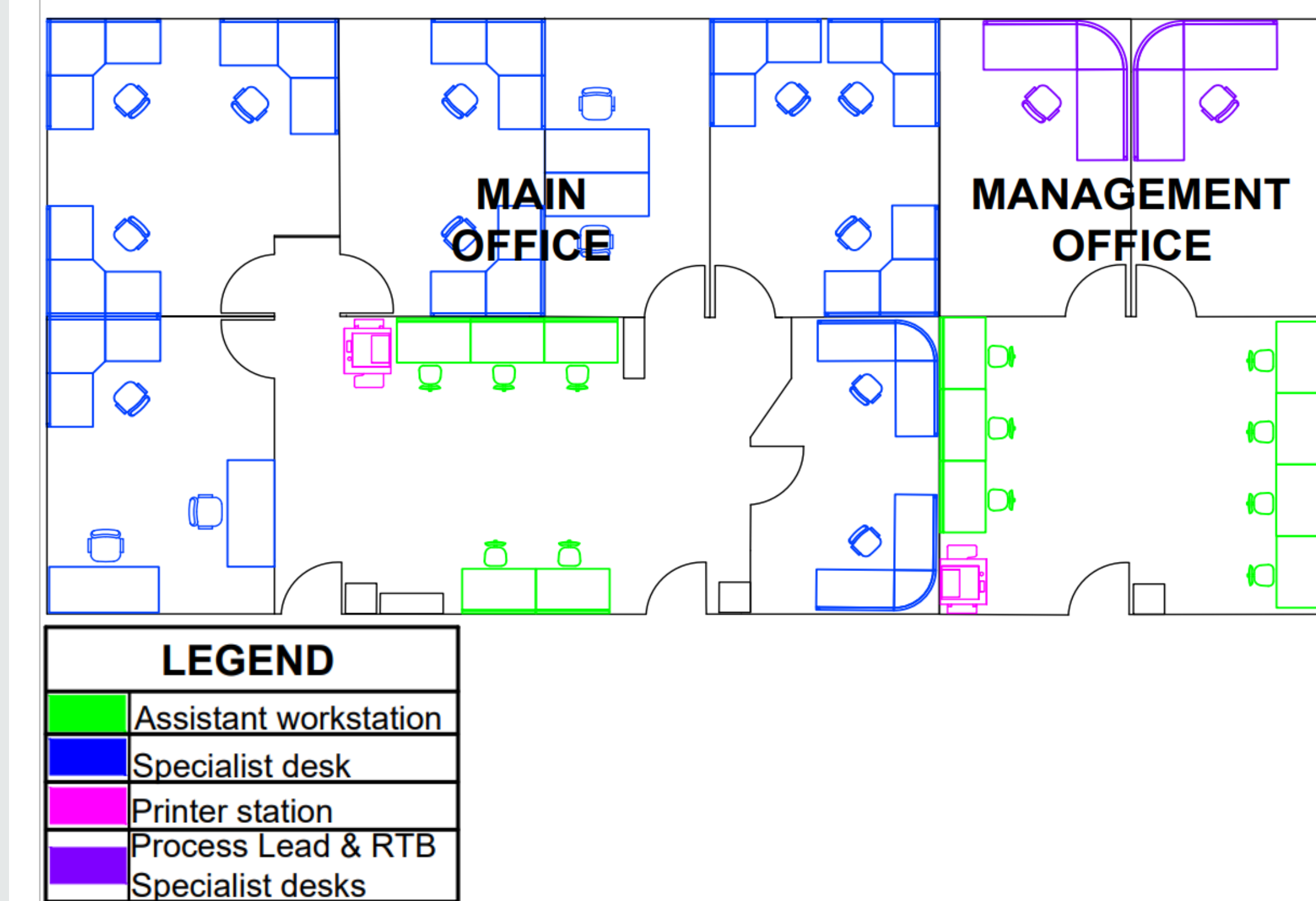
Workers on Duty by Category

Category	1	M	T	W	R	F	S	2	M	T	W	R	F	S	3	M	T	W	R	F	S	4	M	T	W	R	F	S	5	M	T	W	R	F	S	6	M	T	W	R	F	S	7	M	T	W	R	F	S							
Specialists	6	9	9	9	9	7		7	9	9	9	9	7		7	9	9	9	9	6		6	9	9	9	9	7		7	9	9	9	9	6		6	9	9	9	9	6		6	9	9	9	9	6		6	9	9	9	9	6	
Bone Marrow Specialists	3	3	3	3	3	2		2	3	3	3	3	2		2	3	3	3	3	2		2	3	3	3	3	2		2	3	3	3	3	2		2	3	3	3	3	2		2	3	3	3	3	2		2	3	3	3	3	2	
Assistants	8	10	10	10	10	7		7	10	10	10	10	7		7	10	10	10	10	7		7	10	10	10	10	7		7	10	10	10	10	7		7	10	10	10	10	7		7	10	10	10	10	7		7	10	10	10	10	7	

5. Results & Recommendations

Office Layout and Workstation Solution

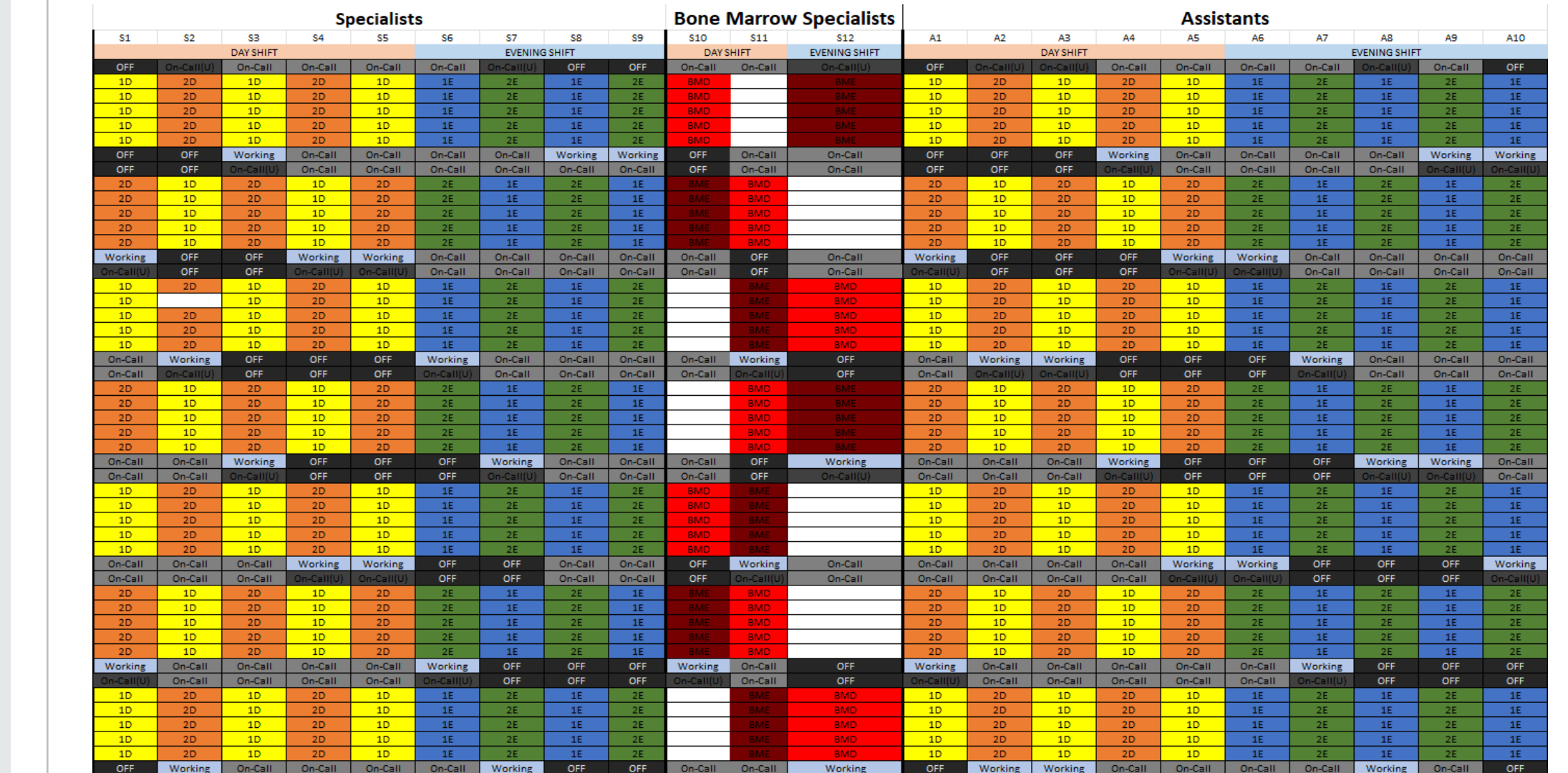
- Using new staffing model provided by RTB
 - 12 assistant workstations
 - 15 specialist desks
- Adjustable standing desk, ergonomic office chair and individual wall file organizer



Scheduling Recommendation

Scale up Scheduling Model

- Optimal staffing model: 9 specialists, 3 bone marrow specialists and 10 assistants
- 7 week rotation of two 8-hour shifts, each employee has 2 weekends fully off (no on-call/overtime)
- New shift introduced on weekend to alleviate work for specialists



References

Burns, R. (1991). *Off-Day Scheduling with Hierarchical Worker Categories*. Kingston: INFORMS