

Lean Design in Healthcare Facilities

Maximizing value by optimizing efficiency

**BOULDER
ASSOCIATES**

ARCHITECTS

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Process-Driven Design: Case Studies in Design for Lean Operations

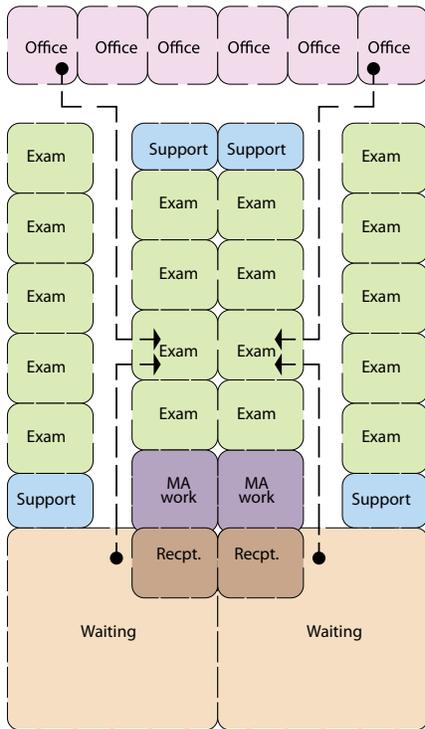


Boulder Associates' fundamental steps of Lean Healthcare Planning and Design

- **Thoroughly document and synthesize existing practices through process mapping, operational study, and plan analysis.**
- **Develop ideal state value streams to guide project design through cross-functional mapping workshops.**
- **Utilize Choosing By Advantages to select the highest-value clinical practices to implement on the project, resulting in a strategy for incorporating operational innovations into the design of the clinical operation.**
- **Optimize the whole by identifying organizational flows that bring the greatest value to a practice.**

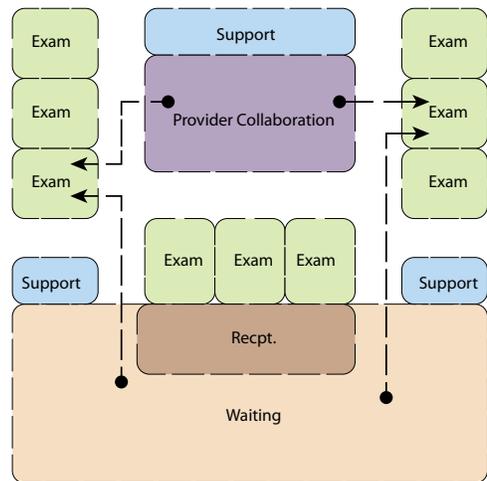
CLINICAL MODEL ASSESSMENT

Our assessment of four current clinical models indicated that a traditional multi-specialty model yielded the lowest SF/Exam and SF/Provider ratios. However, it does so at the expense of shared provider collaboration spaces. Among the three models that support a Lean, collaborative environment, the Denver Health model (B) has the most efficient use of provider and circulation space.



OPTION A
TRADITIONAL MULTI-SPECIALTY MODEL
 3796 SF (NOT INCLUDING WAITING)

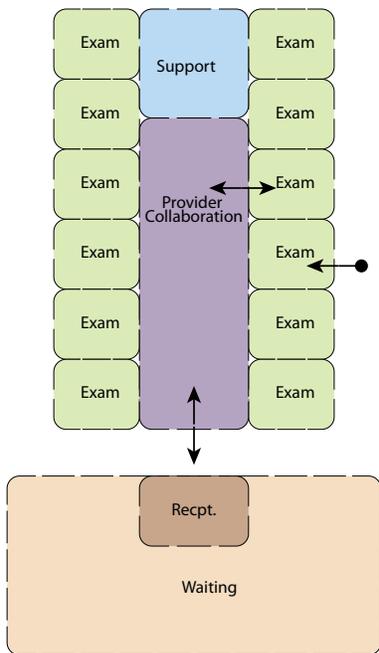
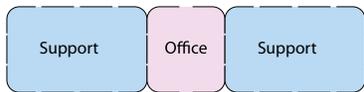
METRICS:
 # OF EXAMS: (18)
 #OF PROVIDERS: (6)
 % OF CIRCULATION: 23.9%
 AREA ALLOCATED TO EXAM SPACE PER UNIT:210 SF
 AREA ALLOCATED PER PROVIDER: 633 SF



OPTION B
DENVER HEALTH MODEL
 2318 SF (NOT INCLUDING WAITING)

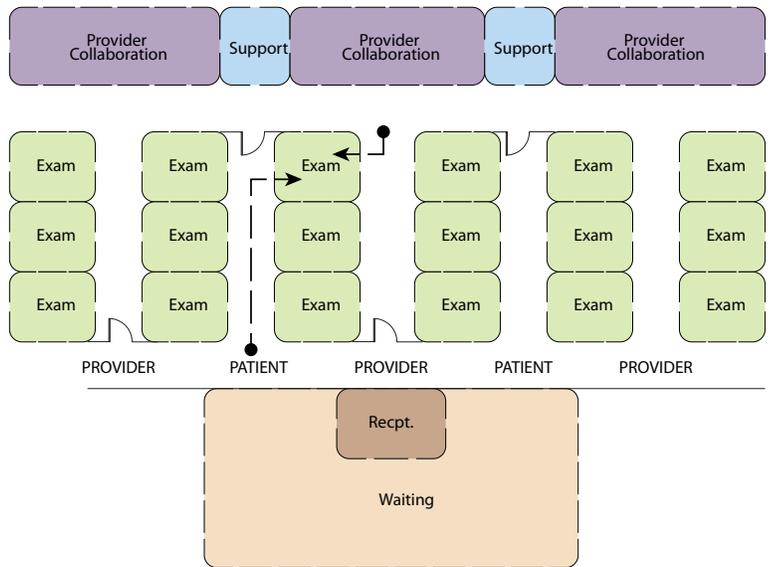
METRICS:
 # OF EXAMS: (9)
 #OF PROVIDERS: (3)
 % OF CIRCULATION: 31.4%
 AREA ALLOCATED TO EXAM SPACE PER UNIT:258 SF
 AREA ALLOCATED PER PROVIDER: 733 SF

CLINICAL MODEL ASSESSMENT



OPTION C
VIRGINIA MASON MODEL
 3629 SF (NOT INCLUDING WAITING)

METRICS:
 # OF EXAMS: (12)
 #OF PROVIDERS: (4)
 % OF CIRCULATION: 33.6%
 AREA ALLOCATED TO EXAM SPACE PER UNIT:302 SF
 AREA ALLOCATED PER PROVIDER: 907 SF



OPTION D
UTAH MODEL
 4714 SF (NOT INCLUDING WAITING)

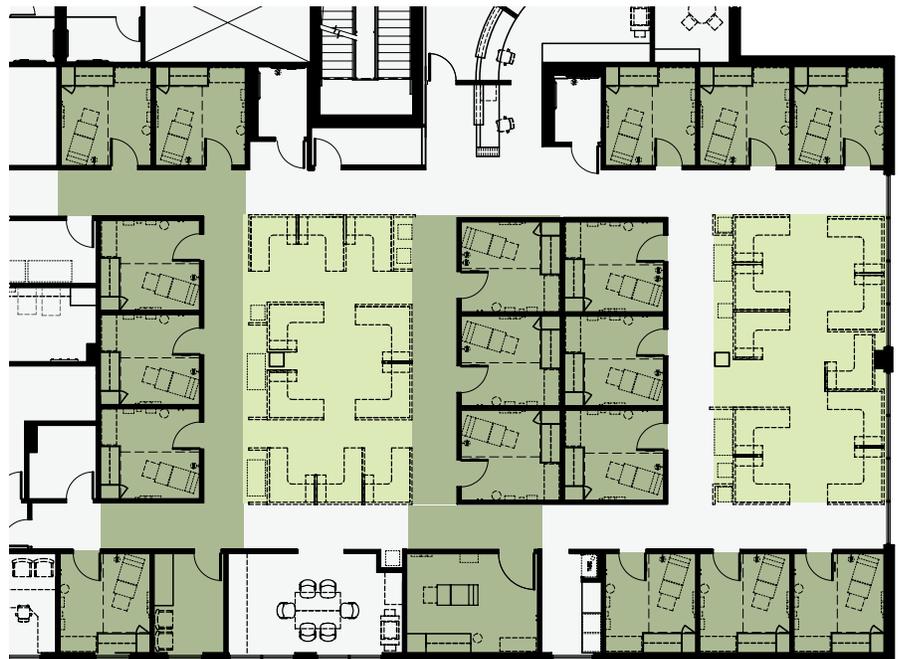
METRICS:
 # OF EXAMS: (18)
 #OF PROVIDERS: (6)
 % OF CIRCULATION: 42.0%
 AREA ALLOCATED TO EXAM SPACE PER UNIT:261 SF
 AREA ALLOCATED PER PROVIDER: 786 SF

DENVER HEALTH PRACTICE MODEL

Denver, Colorado



- Exam rooms
- Clinician collaboration workspace



Over a five-year span, Boulder Associates has worked on three Denver Health Clinic facilities. During the course of these projects, we were able to apply our knowledge of the pod-based practice model, refine the design for Denver Health's particular operating needs, and continue to develop improvements to the model.

- We helped develop the initial open practice pod concept for the Wellington Webb Community Health Center and participated in a physical mock-up program for the typical rooms used in the Webb project.
- We then participated in Denver Health's 3P process for the Park Hill and Montbello Community Health Centers. This resulted in refinement of the practice pods and the typical rooms.
- A further refinement of the pod design resulted in the integration of reception staff with practice pods staff at Montbello for better staff communication and patient management.

CLINICA FAMILY HEALTH SERVICES PEOPLE'S CLINIC LEAN POD CONCEPT

Boulder, Colorado

For a Community Health provider, the pressures of staffing efficiency, space utilization, and cost-effectiveness drive the constant need for forward-thinking approaches to group practice. This design—the latest in a series of evolving approaches to a jointly developed Pod concept of practice for our client—points the way toward a Lean, integrated clinical model. The space planning is driven by a practice model of constant communication, high visibility and interaction of providers, and a consistent, seamless experience for the patient from visit to visit.

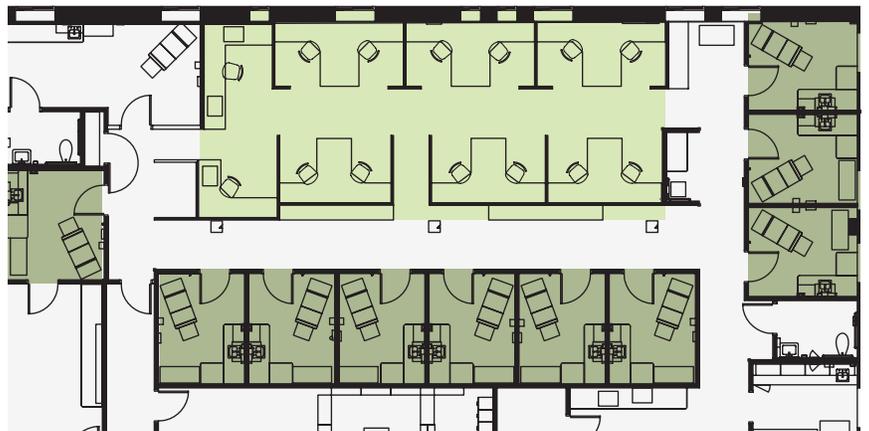
Lean Design

- Open plan central work station bull pen with ringed exam rooms.

Lean Results

- Eliminate Waste
 - Cluster design reduces staff travel by 1.5 miles on typical nursing shift from old clinic to new. (eliminating waste)
 - Patients are placed in an exam room and services rotate in to reduce need to move patient. (Customer pull)
- Increased communication
 - Open visualization reduces staff “hunting”
 - Open bullpen collaboration space provides for easy discussion among providers. (Big Room)
- Visualization of work flow
 - Flag system is used outside each exam room to signal services that are needed. Team members can see the doors of all exam rooms from their workstation. (Andon / Kanban)

- Exam rooms
- Clinician collaboration workspace



MEDICAL GROUP CARE CENTER OF THE FUTURE CONCEPT

Colorado

This Care Center of the Future concept is based on a major health system's Lean-inspired functional program and templates. It supports the "Medical Home" concept and is designed for greater productivity, flexibility, collaboration, quality, increased patient satisfaction, and reduced cost.



Key

- Exam
- Clinician collaborator workspace
- Provider collaboration workspace
- Group exam space
- Check-in

SUTTER MEDICAL FOUNDATION CARE CENTERS

California

A Lean Healthcare Design effort with a Northern California group practice sought to optimize space usage by providers and staff within care centers while standardizing design, construction, and operation of key clinical and support spaces across the foundation. The Boulder Associates project team studied existing family medicine care centers to establish existing best practices and used this data to design features that promoted Lean operations.



Lean Design

- In-room clinical intake for patients

Lean Results

- Increased patient privacy
- Reduces waste in the form of patient travel to and from vitals alcove; Patient can be undressed, weighed, and redressed without having to leave the exam room

Lean Design

- Train clinical staff and provide scheduling access on EHR stations in exam rooms to allow in-room referrals, follow-up, and ancillary services scheduling
- Reduce or remove check-out station at reception



Lean Design

- Place EHR computers in niches along hallways that serve exam rooms.

Lean Results

- Allows providers to quickly access EHR as needed while moving between exam rooms instead of returning to a work station or office.

Lean Design

- Exam+ room that flexes as both exam and procedure room

Lean Results

- Reduces wait time for procedure room availability
- Reduces patient travel between exam and procedure
- Reduces provider travel time to dedicated procedure space
- Reduces waste of built space sitting empty when not in use (typical procedure room)
- Decreases number of dedicated procedure rooms
- Reduces clinical space per provider FTE

Lean Design

- Universal exam rooms served by case carts

Lean Results

- Carts can be replenished at a central location
- Exam rooms can flex across specialties per patient demand

Lean Results

- Reduced patient waiting for front desk staff
- Enhances single point of contact
- Reduces work load on front desk staff

SUTTER MEDICAL FOUNDATION BEST PRACTICES

California

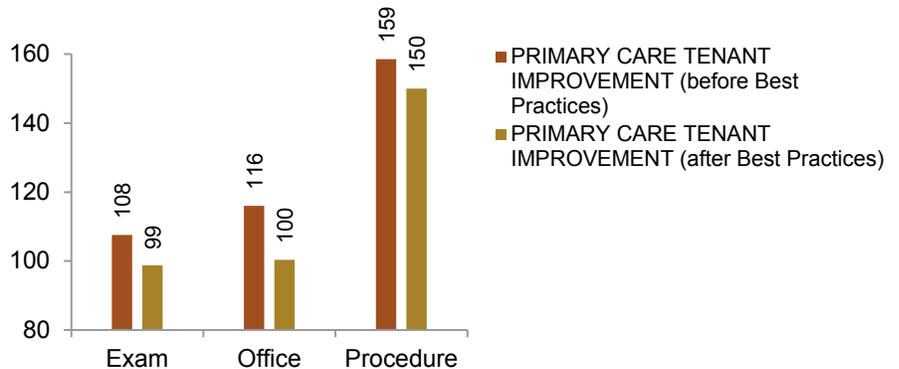
Process

- Study existing operations (internal and external)
- Define study metrics (total encounters per FTE, WRVU per FTE, cost per WRVU, patient satisfaction, and square feet per clinical FTE) and identify the five top performing care centers
- Review top five care centers, including site visits, staff and provider interviews, program and operational reviews, and spatial analysis
- Develop current state process maps for patient and staff flow for each care center
- Develop ideal-state value stream map for family medicine delivery, including operational, information technology, spatial, environmental, and aesthetic factors

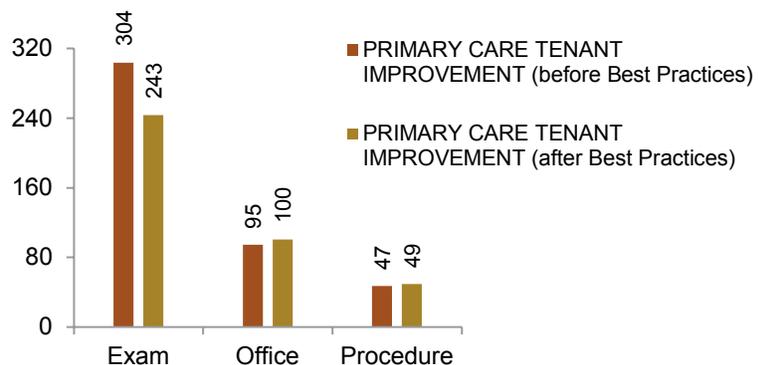
Results

Press-Ganey scores for patient perception of wait before going to exam room, wait in room to see care provider, cleanliness of practice, waiting area comfort/pleasantness, and exam room comfort/pleasantness improved by 5.2% - 8.8% comparing scores from the new practice with the old practice

Average Net Square Feet per Typical Space

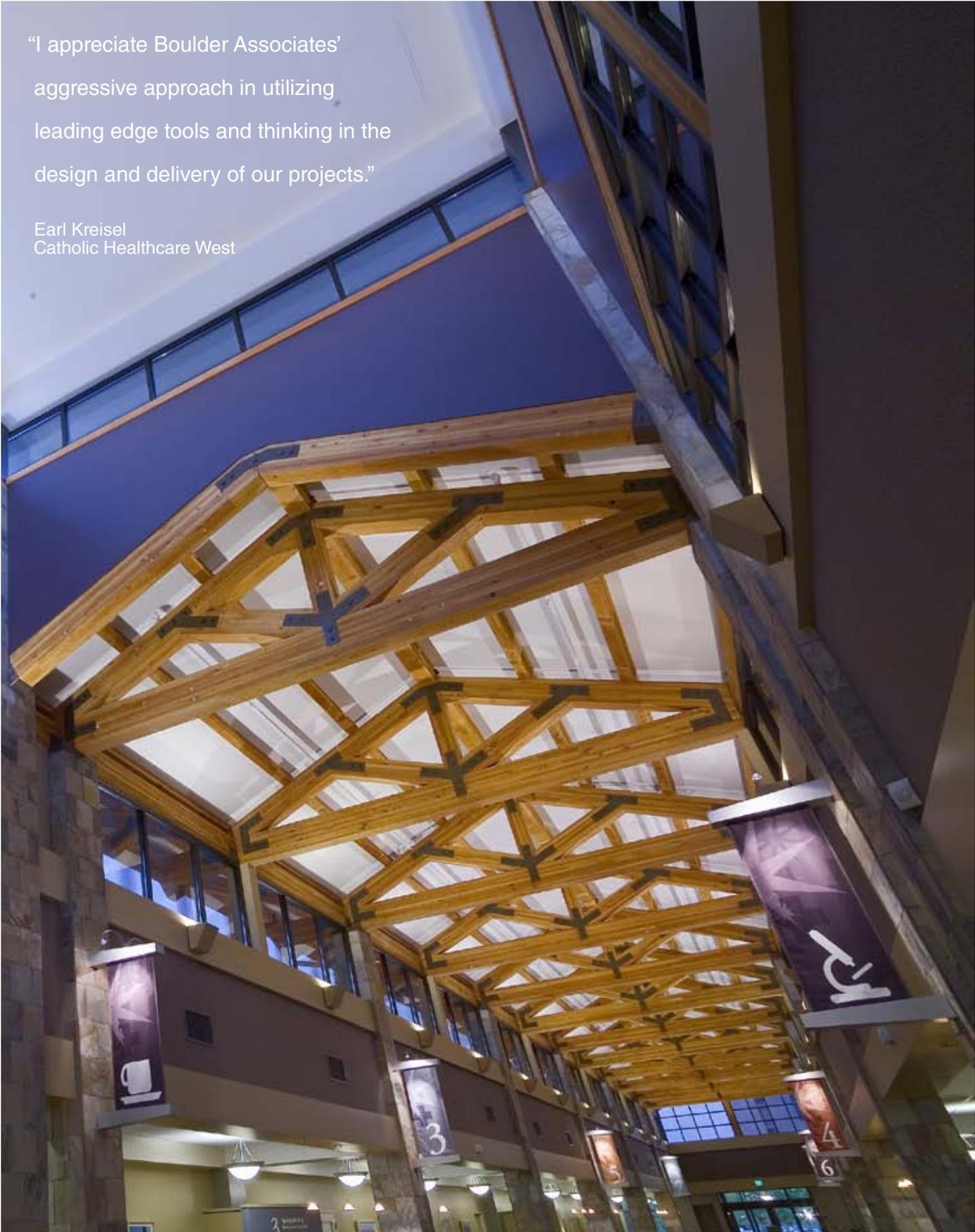


Average Net Square Feet per Provider



“I appreciate Boulder Associates’
aggressive approach in utilizing
leading edge tools and thinking in the
design and delivery of our projects.”

Earl Kreisel
Catholic Healthcare West





Boulder Associates provides comprehensive planning, architecture, interior design, graphic design and construction administration services for clients engaged in the development of healthcare and senior living projects.

BOULDER ASSOCIATES is an award-winning firm, nationally recognized for our ability to solve complex design challenges. We emphasize innovation and teamwork in a collaborative process with clients to form lasting partnerships.

As healthcare and senior living specialists since our founding in 1983, Boulder Associates has unique insight into the core issues that concern clients in the 21st century and the ability to address the intricacies of people, process, technology and economics. We design free-standing

medical centers, ambulatory care and surgery centers, oncology and imaging centers, medical office buildings and hospitals, as well as senior living and daycare environments.

With offices in Colorado, California, and Texas, Boulder Associates maintains a staff of designers who share a belief in the power of design to enrich lives. We believe that good design directly serves the needs of our clients, their patients or residents, and the surrounding community.

“They are committed to understanding new trends and best practices in healthcare operations and delivery.”

DAN CONWELL
SUTTER HEALTH

BOULDER
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