

▶ Whitestone Report

Define M&R Funding Requirements for U.S. Military Hospitals

Military planners needed defensible estimates of M&R funding required for three building types--research hospital, community hospital, and medical clinic--common to domestic U.S. military facilities. The Whitestone MARS system was used to provide detailed funding benchmarks for the three building models, enabling planners to better validate funding requests, to distribute funds according to specific local needs, and to develop a long-term funding plan that anticipates rather than reacts to oscillating M&R requirements over time. Expected deployment of MARS includes over 60 sites nationwide.

For this study, M&R requirements were estimated for three typical medical buildings. The make-up of each building was defined through a component inventory of actual buildings. Specialized hospital components were added to MARS and analyses of work order histories were used to determine unscheduled maintenance ratios and appropriate shop rates. MARS report formats were modified to reflect government budget conventions.

Average funding requirements were found to range from \$2.56 to \$3.11 per gross square foot for the three building types when estimated for the Washington DC area. The estimates varied according to location, largely because of differences in contract and staff labor rates but also due to climate-driven variations in repair frequencies. Re-computing costs for the research hospital at selected locations provided a preliminary funding benchmark and relative cost index.

Average M&R Funding Requirements for Three Medical Building Models

| | Average Annual Costs per Sqft.* | | | |
|----------------------|---------------------------------|--------------|---------------|---------------|
| | First Year | Over 5 Years | Over 20 Years | Over 50 Years |
| Research Hospital | 1.29 | 1.44 | 2.51 | 3.11 |
| Community Hospital | 1.14 | 1.28 | 2.16 | 2.84 |
| Troop Medical Clinic | 1.04 | 1.15 | 2.32 | 2.56 |

*For buildings located in Washington DC. Costs are expressed in undiscounted \$1998.

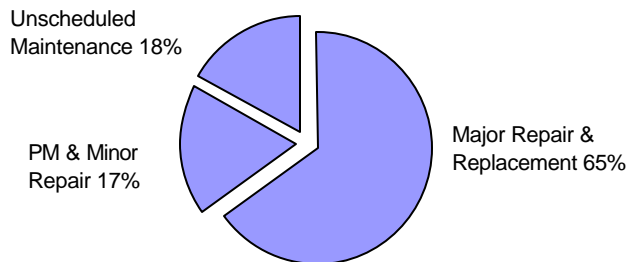
Average M&R Costs For a Research Hospital

Selected U.S. Locations

| | Cost per Sqft* | Index |
|----------------------|----------------|-------|
| Newark, NJ | 3.79 | 122 |
| Honolulu, HI | 3.67 | 118 |
| Anchorage, AK | 3.61 | 116 |
| Los Angeles, CA | 3.61 | 116 |
| Philadelphia, PA | 3.57 | 115 |
| Seattle, WA | 3.44 | 111 |
| Buffalo, NY | 3.39 | 109 |
| St. Louis, MO | 3.31 | 106 |
| Kansas City, KS | 3.26 | 105 |
| Washington DC | 3.11 | 100 |
| Phoenix, AZ | 3.02 | 97 |
| Tulsa, OK | 2.97 | 96 |
| Denver, CO | 2.92 | 94 |
| Baltimore, MD | 2.90 | 93 |
| San Antonio, TX | 2.79 | 90 |
| Memphis, TN | 2.75 | 88 |
| Fort Worth, TX | 2.73 | 88 |
| New Orleans, LA | 2.72 | 87 |
| Richmond, VA | 2.71 | 87 |
| Atlanta, GA | 2.70 | 87 |
| Colorado Springs, CO | 2.61 | 84 |
| Huntsville, AL | 2.61 | 84 |
| Raleigh-Durham, NC | 2.51 | 81 |
| Nashville, TN | 2.45 | 79 |
| Birmingham, AL | 2.33 | 75 |
| Beaufort, SC | 2.29 | 74 |

* Average annual costs forecast over a 50-year building lifetime. Costs are expressed in undiscounted \$1998.

The distribution of M&R costs by type is dominated by major repair and replacement costs over a 50-year building life.



For a Research Hospital located in Washington DC.

Key Assumptions

- Material and Labor costs, including in-house staff salaries and contract labor rates, were taken from the *Whitestone Building Maintenance and Repair Cost Reference 1998*; a markup rate of 2 on basic wages was used for calculating in-house shop rates.
- Preventive maintenance (PM) and minor repair tasks for most building components would be performed by in-house staff, while all renewal and replacement tasks would be performed using contract labor; MARS unscheduled maintenance multipliers were set at 2, implying that approximately 50 percent of non-major repair costs were unscheduled.