Executive Summary

Children’s Hospital and Regional Medical Center (CHRMC) is proposing a 1.5 million square foot facility expansion over the next 15 to 20 years, including approximately 350 new inpatient beds. This expansion would bring the hospital’s total number of pediatric inpatient beds to 600. CHRMC is currently licensed by DOH for 250 beds. In December 2007, the Laurelhurst Community Club sought an independent review of the validity of CHRMC’s bed proposal. It commissioned Field Associates, specialists in healthcare and hospital planning, to conduct this review in accordance with the Washington State Department of Health’s 12-step methodology for forecasting beds.

By law, the Washington Department of Health allocates a statewide pool of hospital beds according to geographic region and service type to ensure against over-expansions detrimental to the public interest. As recently as 2007, the Washington Legislature determined:

That excess capacity of health services and facilities place considerable economic burden on the public who pay for the construction and operation of these facilities as patients, health insurance purchasers, carriers, and taxpayers. [RCW 43.370.030(2)(a)]

Based on the Department’s published method of distributing hospital beds across the state, this study finds no support for the addition of inpatient beds to CHRMC’s current capacity of 250 beds until after the the year 2015. A small increase in beds – up to 40 – may be warranted by the year 2026 (the very end of CHRMC’s 15- to 20-year master plan planning horizon.

Under the Department of Health’s projection method and using the data currently available, CHRMC’s addition of any more than 40 pediatric inpatient beds before 2026 would create an oversupply of such beds in Washington. The CHRMC proposal to add 350 beds would create an imbalance in the distribution of hospital beds among the institutions that provide inpatient pediatric care for Washington’s children.
Introduction and Background
Children's Hospital and Regional Medical Center (CHRMC) is a non-profit pediatric specialty hospital located in Seattle, Washington. It is one of three pediatric specialty hospitals in Washington and serves patients from across Washington State. For some specialty services, CHRMC serves a broader geographic area including adjacent states.

In 2007, CHRMC requested initiation of a Major Institution Master Plan (MIMP) process for its hospital campus located in the Laurelhurst neighborhood of northeast Seattle, Washington. This MIMP process creates a Citizens Advisory Committee charged with advising the City of Seattle regarding a hospital's proposed Major Institution Master Plan. Among the factors to be considered under the City’s MI code are

“whether the planned development and changes of the Major Institution represent a reasonable balance of the public benefits of development and change with the need to maintain livability and vitality of adjacent neighborhoods.”

In applying this criterion, the City’s land use code requires that consideration be given to “reasons for institutional growth and change” as well as “the public benefits resulting from the planned new facilities and services.” SMC 23.69.032.E.2 and .2.a.

Under its proposed master plan, CHRMC would increase its hospital beds from 250 to approximately 600 and expand its facilities by 1.5 million square feet over the next 15 to 20 years. CHRMC’s bed forecast for the year 2026 is 632.

Table 1: Summary of CHRMC Bed Proposal to Major Institutions

<table>
<thead>
<tr>
<th>Community Advisory Committee</th>
<th>2010</th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHRMC’s Current Bed Count</td>
<td>250</td>
<td>250</td>
<td>250</td>
<td>250</td>
</tr>
<tr>
<td>CHRMC’s MIMP Projections</td>
<td>413</td>
<td>478</td>
<td>548</td>
<td>632</td>
</tr>
<tr>
<td>Difference</td>
<td>+163</td>
<td>+228</td>
<td>+298</td>
<td>+382</td>
</tr>
</tbody>
</table>

Most of the physical expansion requested by CHRMC is for its additional proposed hospital beds, which must be licensed by the Washington Department of Health (the Department). The Department’s approval process includes a 12-step method for forecasting beds. Because of the significant size of CHRMC’s proposed bed increase, which it cites as a major basis for its planned facility expansion, the Laurelhurst Community Club sought an independent review of CHRMC’s projections and asked that they be performed in accordance with the Department’s 12-step methodology.

The Laurelhurst Community Club therefore contracted with Field Associates to perform this study and describe its findings. Field Associates’ Principal, Nancy Field, has twenty-five years experience in the planning and development of healthcare and hospital services in the Northwest. Ms. Field has led the planning activities of three major healthcare institutions in the Seattle area and, as a health planning consultant, has completed over fifty consulting engagements. With a graduate degree in urban
planning, Ms. Field sat on the original city task force that designed Seattle’s Major Institutions Master Planning process

Purpose and Scope
A chief tenet of statewide healthcare planning is that it is in the interest of the people of Washington to foster a planned, orderly development of health care services. The Legislature directed that the state’s oversight of hospital bed supply is essential to optimal and effective use of health care monies. Since well over half of all hospital bills are paid by taxpayers on behalf of Medicare or Medicaid patients, the prescribed control of hospital bed supply is a key tool in managing scarce public resources.

As recently as 2007, the Washington Legislature determined:

That excess capacity of health services and facilities place considerable economic burden on the public who pay for the construction and operation of these facilities as patients, health insurance purchasers, carriers, and taxpayers [RCW 43.370.030(2)(a)]

In keeping with this mandate, an institution such as CHRMC cannot lawfully construct any additional beds nor can the Department’s Facility and Services Licensing division license them without a Certificate of Need, the state’s version of a “hospital building permit.” As noted above, analogous provisions of the Seattle Major Institutions Code call for balancing the public benefits of a major institution’s proposed expansion against its impacts. To provide a basis for assessing public benefit, this study adopts the Washington Department of Health’s twelve-step method and applies it to CHRMC’s proposal to add 350 beds to its present complement of 250.

Approach
The Washington Department of Health’s Facility and Services Licensing Division uses a 12-step calculation method to determine how many hospital beds each geographic region of the state should have. Using that method, the Department allocates licensed hospital beds among the 200+ hospitals in Washington. For twenty years this regulatory approach, based originally in the 1987 State Health Plan, has guided the allocation of hospital beds across Washington’s geographic areas and clinical services (i.e., medical-surgical, obstetrics, pediatrics, psychiatry). The Department applies this 12-step method to assess specific applications for hospital beds as individual hospitals apply for permission to expand or add services.

Occupancy rates
A central factor of the Department’s method is deciding what hospital occupancy rate to use in the calculations. For example, in planning to serve an average of 50 inpatients every day, it would take a 100-bed hospital to achieve a 50% occupancy rate. The Department uses a sliding scale of occupancy, acknowledging that the larger the hospital, the higher occupancy it can accommodate. The 1987 State Health Plan called for a hospital of 200-299 beds such as CHRMC to plan for a 75% occupancy rate. In the last few years, the Department lowered the rate from 75% to 70%. It found that Washington’s hospitals were struggling daily with matching patient roommates by sex, diagnosis, contagion level, etc. In 2007, however, the private, single patient room
became the national standard for hospital construction. Now, the 299-bed hospital with a 70% average occupancy will have, not 90 empty beds, but 90 empty private rooms available into which patients can flexibly be placed.

The efficiency of single-patient rooms is obvious to all who work in hospitals. Matching roommates is a thing of the past; the rapidly growing problem of placing very contagious patients with MRSA (methycillin resistant staphylococcus aureus) is more readily addressed; national laws assuring patients their privacy can be followed; staff time is not wasted shuffling patients from room to room as new patients are admitted and new roommate matches created daily. This study assumes that a 75% occupancy rate is now conservative for a 200-299 bed hospital such as CHRMC which is planning to move to all single patient rooms. As an alternate, the study also calculates CHRMC’s bed requirements at an 80% occupancy rate, which is used by the Department for hospitals with 300+ beds. If CHRMC’s bed count approaches 300, 80% occupancy will become a reasonable standard.

Method
This report replicates and updates the Department’s 12-step analysis and approval of a recent application by CHRMC to add pediatric hospital beds. Those steps include:

1) **Gather and analyze trend information on hospital utilization** (Steps 1 – 4)
   - Step 1: Compile 10-year historical patient days data
   - Step 2: Separate short stay psychiatry days from general medical/surgical acute care days
   - Step 3: Compute each year’s use rate – inpatient days per 1,000 population
   - Step 4: Compute the trend line and slope (average annual change) over the 10-year historical period

2) **Calculate baseline non-psychiatric bed need forecasts** (Steps 5-10)
   - Step 5: Correct for patient migration between planning areas
   - Step 6: Compute age-specific use rates
   - Step 7: Apply the historic trend in the use rate forward through the forecast period
   - Step 8: Apply the projected use rate to the projected population
   - Step 9: Adjust for patient migration between planning areas and states
   - Step 10: Apply occupancy rates to average daily census to determine number of beds required

3) **Determine the total baseline hospital bed need forecasts, including need for short-stay psychiatric**
   - Step 11 projects short-stay psychiatric bed need, and
Step 12 is the adjustment phase, in which any necessary changes are made to the calculations in the prior steps to reflect conditions that might cause the pure application of the methodology to under- or over-state the need for acute care beds.

In addition to this report labeled “Summary Findings & Conclusions” there is a separate, more technical document titled: “Study of Bed Projections for Children’s Hospital and Regional Medical Center, Based on Department of Health 12-Step Methodology and Worksheets.” The “Methodology and Worksheets” document provides the detail of each step used for this study. It also includes the worksheet format used by the Department in its 2002 projections for CHRMC and shows the resulting updated calculations as the Department would show them.

Summary Findings of the Study

For most readers, a graphic representation of this study’s findings will be the most convenient and useful. Accordingly, the following four charts summarize the results of the twelve mathematical steps required by the Department of Health:

**Historical patient days**
Charts 1 and 2 and their data tables show annual pediatric patient days for the last ten years. This historical data comes from CHARS, the Department’s own hospital patient data reporting system:

- Chart 1 shows that while pediatric inpatient days for non-psychiatry patients have been increasing among all pediatric providers statewide, the number of patient days for Washington residents ages 0-14 at CHRMC has been relatively stable over the last ten years.
- Chart 2 shows that short-term psychiatry days are dropping for statewide pediatric providers but the number of patient days for Washington residents at CHRMC is relatively stable with just a slight downward trend. It would take further analysis to know whether these changes result from a drop in admissions or in length of stay for psychiatric patients in Washington.

**Historical trends in use rates**
Chart 3 takes the ten-year trend in Washington resident patient days from Chart 1 and adjusts for annual population changes among Washington residents age 0-14. This allows for annual trending of a pediatric hospital “use rate.” The department defines “use rate” as the “rate at which residents of an area use inpatient hospital services and is expressed as the number of patient days per 1,000 population.” (State Health Plan, Volume II. Page C-54)

- Chart 3 and its data table shows that the rate of use of CHRMC by each 1,000 Washington residents age 0-14 increased very slowly, or 4% over ten years for non-psychiatry patients. On the other hand, an examination of the data shows that the non-psychiatry rate of use of all other hospitals by the same group increased 4 times as fast, or 16% over the same 10-year period.
- Chart 3 shows the 10-year average annual change (“slope”) in the use rate for non-psychiatry inpatients for CHRMC and Statewide. These slopes are
CHART 1

10-Year History of Pediatric Non-Psychiatry Inpatient Days, WA Residents Age 0-14, showing CHRMC and Statewide Utilization

Source: WA Dept of Health, CHARS Data

- **STATEWIDE**
- **CHRMC**

<table>
<thead>
<tr>
<th>Year</th>
<th>STATEWIDE</th>
<th>CHRMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>213,564</td>
<td>44,789</td>
</tr>
<tr>
<td>1998</td>
<td>218,025</td>
<td>44,640</td>
</tr>
<tr>
<td>1999</td>
<td>194,552</td>
<td>41,113</td>
</tr>
<tr>
<td>2000</td>
<td>221,392</td>
<td>44,926</td>
</tr>
<tr>
<td>2001</td>
<td>226,675</td>
<td>43,731</td>
</tr>
<tr>
<td>2002</td>
<td>221,850</td>
<td>42,495</td>
</tr>
<tr>
<td>2003</td>
<td>225,617</td>
<td>44,271</td>
</tr>
<tr>
<td>2004</td>
<td>232,771</td>
<td>46,121</td>
</tr>
<tr>
<td>2005</td>
<td>242,436</td>
<td>48,665</td>
</tr>
<tr>
<td>2006</td>
<td>245,799</td>
<td>47,318</td>
</tr>
</tbody>
</table>
CHART 2

10-Year History of Short-Term Pediatric Psychiatry Inpatient Days, All WA residents, Age 0-14, showing CHRMC and Statewide Utilization

Source: WA Dept of Health CHARS Data

<table>
<thead>
<tr>
<th>Year</th>
<th>Statewide</th>
<th>CHRMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>19,301</td>
<td>3,781</td>
</tr>
<tr>
<td>1998</td>
<td>21,629</td>
<td>3,696</td>
</tr>
<tr>
<td>1999</td>
<td>18,102</td>
<td>3,307</td>
</tr>
<tr>
<td>2000</td>
<td>18,819</td>
<td>3,902</td>
</tr>
<tr>
<td>2001</td>
<td>15,747</td>
<td>3,730</td>
</tr>
<tr>
<td>2002</td>
<td>14,443</td>
<td>3,720</td>
</tr>
<tr>
<td>2003</td>
<td>14,218</td>
<td>3,384</td>
</tr>
<tr>
<td>2004</td>
<td>14,050</td>
<td>2,781</td>
</tr>
<tr>
<td>2005</td>
<td>12,459</td>
<td>3,975</td>
</tr>
<tr>
<td>2006</td>
<td>11,691</td>
<td>3,489</td>
</tr>
</tbody>
</table>
Study of CHRMC Bed Projections for LCC
Summary Findings & Conclusions 1/22/08

CHART 3
10-Year Trendline of Pediatric Hospital Use Rate
Annual Patient Days per 1,000 WA Residents Ages 0-14
excludes psychiatry & hospital newborns
Calculations per WA Department of Health Method

<table>
<thead>
<tr>
<th>Year</th>
<th>CHRMC</th>
<th>STATEWIDE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>35.8</td>
<td>170.8</td>
</tr>
<tr>
<td>1998</td>
<td>35.5</td>
<td>173.6</td>
</tr>
<tr>
<td>1999</td>
<td>32.6</td>
<td>154.2</td>
</tr>
<tr>
<td>2000</td>
<td>35.8</td>
<td>176.4</td>
</tr>
<tr>
<td>2001</td>
<td>34.7</td>
<td>180.0</td>
</tr>
<tr>
<td>2002</td>
<td>33.7</td>
<td>176.1</td>
</tr>
<tr>
<td>2003</td>
<td>35.2</td>
<td>179.6</td>
</tr>
<tr>
<td>2004</td>
<td>36.7</td>
<td>185.1</td>
</tr>
<tr>
<td>2005</td>
<td>38.6</td>
<td>192.4</td>
</tr>
<tr>
<td>2006</td>
<td>37.2</td>
<td>193.4</td>
</tr>
</tbody>
</table>

Statewide Slope
\[ y = 3.0069x + 161.62 \]

CHRMC Slope
\[ y = 0.3165x + 33.855 \]
Summary Findings & Conclusions 1/22/08

CHRMC Current Capacity, 250 beds = 68,437 patient days @ 75% occupancy

CHART 4
CHRMC Projected Inpatient Days Ages 0-14
compared to current capacity
using WA Department of Health Method

Acute Inpatient Days
WA residents

Acute Inpatient Days
Out of State

Psychiatric Inpatient Days

Inpatient Days per Year

Year

used to project utilization forward toward the target year. The DOH method adopts the most conservative of the two “slopes” so the CHRMC slope was adopted here for Steps 9 and forward.

Projected patient days and beds
Chart 4 shows the results of the 12-step method. The Chart portrays the number of patient days CHRMC can expect to see for each year through this study’s nine-year forecast to 2015.

• Each column (blue) in Chart 4 is the annual total of CHRMC’s projected inpatient days. As the shading indicates these patient days represent CHRMC’s
  - psychiatry patients,
  - Washington non-psychiatry patients, and
  - out of state non-psychiatry patients.

• As Chart 4 shows, this study adopted a nine-year projection period to 2015. 2015 was selected to provide comparison to CHRMC’s own interim projection to that year. On the other hand, while the Department uses a seven-year horizon for hospital beds, CHRMC’s Master Plan proposal is based on a forecast going out 19 years to 2026. The reliability of a 19-year projection period in the changing healthcare market is subject to question. Chart 3 above underscores this concern since it shows CHRMC’s share of inpatients shrinking relative to other pediatric providers in Washington. Coupling that with rapid population growth in other areas of Washington - and in Idaho and Montana - it is very likely that the growth rate of other pediatric inpatient units will continue to outstrip CHRMC’s in the period to 2026.

• Chart 4’s horizontal dashed line (in orange) is set at CHRMC’s current patient day capacity. That is, with its current capacity of 250 beds, and using a 75% average occupancy, CHRMC can provide 68,437 patient days of care in any given year and will not need any new beds until after 2015. This contrasts with CHRMC’s estimate that it will need 228 additional beds by 2015 and 350 by 2026.

Conclusions
A wide variety of observations are available on review of the study data. Most germane to the current issues before Laurelhurst Community Club are the following:

1. There is a large disparity between study results and the number of beds proposed by CHRMC.

Both Chart 4 above and Table 2 below show that the increase of 350 beds proposed by CHRMC is not consistent with the Department’s established methodology for projecting required hospital beds. If the additional 228 beds proposed for 2015 are
built, the CHRMC planning area is projected to experience a surplus of 236 beds in 2015. If the proposed bed increases are implemented with the phasing illustrated by CHRMC, the planning area is projected to have a surplus of 308 beds by the end of year 2026.

In contrast, the Department of Health method of projecting inpatient beds supports CHRMC’s adding 23-41 beds after 2015, depending on whether occupancy averages 75% or 80%.

Table 2: Beds Required at CHRMC, at 75% and 80% occupancy, Years 2015 & 2026

<table>
<thead>
<tr>
<th></th>
<th>Year 2015</th>
<th>Year 2026</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>75% occupancy</td>
<td>80% occupancy</td>
</tr>
<tr>
<td>Inpatient acute care</td>
<td>228.9</td>
<td>214.6</td>
</tr>
<tr>
<td>Inpatient psychiatry</td>
<td>12.3</td>
<td>11.6</td>
</tr>
<tr>
<td>Total licensed now</td>
<td>250.0</td>
<td>250.0</td>
</tr>
<tr>
<td>Additional CHRMC beds</td>
<td>(8.8)</td>
<td>(23.8)</td>
</tr>
</tbody>
</table>

Numbers in ( ) parentheses are negative.

In order to illustrate the disparity in projections, assume that, based on this range of 23-41 beds, one adopts a goal to add 35 beds at CHRMC. Now, consider the contrast with CHRMC’s own intention to add 350 new beds: CHRMC proposes ten times more new capacity than this study finds is warranted through application of the Department’s method.

For a more detailed understanding of the differences, first isolate the large effect of differing occupancy rate assumptions. From there, additional sensitivities can be identified and quantified.

2. Other pediatric providers need to be acknowledged.

Since the Department’s 1980’s projection employed a “Children’s-only” statewide pediatric planning area, other leading pediatric providers have emerged across the state:

- In 2003, and after the Department’s 2002 decision to acknowledge a “Children’s-only” planning area, Sacred Heart Children’s Hospital was opened in Spokane.
- Substantial service development has taken place at Tacoma’s Mary Bridge Children’s Hospital and it is the state’s recognized pediatric trauma center for Southwestern Washington.
- In Seattle, Swedish Hospital’s inpatient pediatric services now care for more King County children than does CHRMC.
Additionally, a significant number of other hospitals – in the Seattle area and statewide – may be adversely affected by CHRMC’s proposal to build more than its share of pediatric beds. The following pie chart shows the 2006 average daily count (census) of King County children at key providers of pediatric hospital care in King County. (Data source: CHARS) Though Swedish Medical Center and CHRMC provide over half the care, many other area hospitals provide pediatric services as core to their purpose and commitment to the communities they serve.

Any valid review of the proposed CHRMC project will acknowledge the role of other Seattle-area hospitals in serving children and will consult with them in assessing the potential impact of the proposed bed addition.
3. **Key psychiatry providers need to be acknowledged.**

CHRMC projects its number of psychiatry bed will need to increase from its current capacity of 20 beds to 194 by 2026. This study projected approximately 13 beds for 2026 using the Department method. In addition, CHARs data shows that CHRMC averages less than 2% of its psychiatry patients from out of Washington thus suggesting that the multi-state role it plays for some pediatric specialty services does not extend to short-term, inpatient psychiatry.

There are a number of key providers for short-term, inpatient pediatric psychiatry services in Washington. Table 3 below shows the relative sizes of these providers.

**Table 3: Key Pediatric Psychiatry Providers in Washington, 2006**

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Key Counties Served</th>
<th>Percent of All Washington Residents Served, Age 0-14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fairfax</td>
<td>King, Snohomish, Pierce</td>
<td>34%</td>
</tr>
<tr>
<td>CHRMC</td>
<td>King, Pierce, Snohomish</td>
<td>30%</td>
</tr>
<tr>
<td>Sacred Heart</td>
<td>Spokane</td>
<td>20%</td>
</tr>
<tr>
<td>Lourdes</td>
<td>Yakima, Benton</td>
<td>12%</td>
</tr>
</tbody>
</table>

Though these providers serve large numbers of Washington’s children, they were excluded from the “Children's-only” statewide planning area acknowledged in the Department’s 2002 analysis of CHRMC’s bed requirements. The existing beds and services of these facilities cannot be ignored in statewide planning for short-term pediatric psychiatry inpatient beds.

4. **Psychiatry services plan needs clarification**

CHRMC proposes adding 350 beds by 2026 for a total of 600 beds. 194 of the 600 have been characterized as short-term psychiatry beds. Nevertheless, it is not clear that CHRMC has really settled on the mix of the two it desires and it appears to be treating the two types of beds interchangeably:

- CHRMC has not proposed a separate licensed psychiatric hospital nor has it discussed an alternative location for its initial proposal of 194 psychiatric beds. This large a psychiatric facility would likely have economies of scale allowing for a viable separate campus or co-location with one of the other existing psychiatric hospitals in the Seattle area.

- CHRMC recently indicated that about 94 of the projected 194 psychiatry beds may instead be used for acute medical surgical patients.
• CHRMC has indicated that it requires 4,000 square feet per hospital bed. Yet short-term care of psychiatric patients does not require the diagnostic, treatment and support space that acute care does.

CHRMC has not provided a consistent statement of the inpatient services it plans to offer. This clarification is necessary if the City of Seattle is to evaluate CHRMC’s proposed Major Institution Master Plan. And, if CHRMC is genuinely considering either 100 or 194 psychiatric beds, a reasonable discussion of alternatives would include CHRMC’s establishment of a pediatric psychiatric hospital at a location separate from the current campus.

5. **Unnecessary hospital beds are expensive to the community.**

The Department of Health 12-step method tells us the minimum number of hospital beds required in order to benefit patients and the public but it also places a ceiling on the desired number of beds. Nevertheless, CHRMC’s proposal of 350 new beds appears to be approximately ten times the actual number required at CHRMC twenty years from today.

In light of such an oversupply, CHRMC’s proposal may not provide a public benefit that outweighs its negative impacts. Based on just the numeric need methodology of the Department, CHRMC’s proposal to add 350 acute care beds is not consistent with the mandate established by the legislature nor with the public benefit balancing required by in the Major Institutions chapter of Seattle’s Land Use Code. Rather, by unnecessarily duplicating hospital beds, the CHRMC Master Plan can be expected to have unwanted impacts on the financial and program viability of other hospitals and to unnecessarily increase the cost of health care both locally and in the state. Under-used hospital beds put extra costs into the health care system, thus driving up the taxes and health care premiums we all pay to support it. As the Washington legislature stated, when hospitals over-build, “that excess capacity of health services and facilities place considerable economic burden on the public.”