# Public Services

APPENDIX M

APPENDIX M

# Appendix M-1

## Medical Services Analysis Methodology, Envicom Corporation, February 2017

# TECHNICAL APPENDIX M-1:
# PUBLIC SERVICES – Medical Services Analysis Methodology

## Introduction

The purpose of this Technical Appendix is to describe the approach to assessing the adequacy of medical service infrastructure relative to population and the methodology used to forecast hospital occupancy rates presented in Section 4.18, Public Services – Medical Services, of the Paradise Valley Program Environmental Impact Report (EIR). The term 'hospital' is used throughout this analysis to refer to any type of inpatient medical facility.

## Background

The Office of Statewide Health Planning and Development (OSHPD), a department under the California Health and Human Services Agency, collects data and disseminates information about California's healthcare infrastructure.[1] Both publically and privately-owned hospitals in California report data to the OSHPD. In assessing the condition of California's network of hospitals, the California Legislative Analyst's Office previously recommended that the Legislature direct the "OSHPD to review statewide hospital bed occupancy data to examine how occupancy rates vary by region and to determine, on a regional basis, if there is an oversupply or undersupply of hospital beds."[2] This analysis applies the approach of this recommendation to determine where shortages may exist in the local medical system based on hospital bed occupancy rates. As explained herein, analysis based on actual bed occupancy rates provides a more accurate indication of remaining hospital capacity than licensed hospital-to-resident ratios and licensed hospital bed-per-resident ratios.

## Medical Service Study Areas

In assessing the adequacy of healthcare facilities, there is a need to define the service area for a population served by a given hospital. The OSHPD uses sub-city and sub-county geographical units called Medical Service Study Areas (MSSAs) to organize and display population, demographic, and physician data for assessing needs, healthcare planning, and healthcare policy development. Each MSSA polygon is created from one or more U.S. Census tracts. The Health Resources and Services Administration of the U.S. Department of Health and Human Services formally recognizes California's MSSA unit of geography as the Rational Service Area for medical service in California.[3] In planning for healthcare facilities, MSSAs are helpful definitions of the service population associated with a given hospital. For example, the population of the MSSA associated with John F Kennedy Memorial Hospital is 96,494 people.

## Refining the Healthcare Planning Metrics

In the absence of a standard federal or statewide approach to determining the adequacy of the capacity of medical service facilities relative to population, licensed hospital-to-resident ratios and licensed bed-to-resident ratios have previously been used to determine whether the number existing medical facilities is adequate relative to population. As discussed below, these approaches do not factor in hospital size or the actual use of hospital beds, making them a less accurate basis for determining of the adequacy the capacity of medical service facilities relative to population.

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[1] OSHPD, About OSHPD, www.oshpd.ca.gov/AboutUs.html (accessed January 20, 2015).

[2] Legislative Analyst's Office: Health and Social Services. *Hospitals Facing Financial Headaches*. Analysis of the 2002-2003 Budget Bill, www.lao.ca.gov/analysis_2002/health_ss/healthss_05_CC_HFFH_anl02.htm (accessed July 23, 2015).

[3] OSHPD, Medical Service Study Areas, www.oshpd.ca.gov/hwdd/MSSA/index.html (accessed February 12, 2015).

Licensed hospital-to-resident ratios indicate the number of people served for every one hospital within the limits of a service area. Service areas can be defined as states, counties, or any number of other localized units of geography. For example, there are 24 licensed hospitals in Riverside County serving approximately 2,295,298 people, resulting in one licensed hospital per 95,637 residents. Hospital-to-resident ratios do not, however, account for the different *sizes* of hospitals in terms of the number of beds available for inpatients. Consider, for instance, a large service population with a high number of hospitals that may in fact be underserved because each hospital is undersized relative to the service population.

Licensed bed-per-population ratios indicate the number of beds available to serve a specified unit of population. For example, hospitals in Riverside County have a total of 3,945 beds, resulting in a ratio of 1.7 beds per 1,000 residents. Licensed bed-per-population ratios more accurately indicate hospital capacity relative to population than hospital-to-resident ratios because they account for the size of the hospital in terms of the number of licensed beds. Licensed bed-per-population ratios do not, however, account for the *use* of a given hospital's capacity.

Hospital occupancy rates are a calculation indicating the actual consumption of an inpatient health facility for a given time period. In other words, the occupancy rate measures how much of a hospital is used by the population that hospital serves. The OSHPD calculates, occupancy rates by dividing the number of patient (census) days by the number of bed days. Bed days are the number of days in the reporting period (typically 365) times the number of beds. The formula for calculating occupancy rates is provided below.

**Occupancy rate = [patient days / (days in reporting period x number of beds)] x 100**

For example, for the 365-day time period from January 1 to December 31 of 2013, the licensed bed occupancy rate of John F. Kennedy Memorial Hospital was 43.6%. The data used in this calculation is provided below.

Occupancy rate = [24,807 patient (census) days / 365 days x 156 licensed beds] x 100

43.6% = [24,807 patient (census) days / 56,940 bed days] x 100

Hospital occupancy rates account for the physical use of hospital capacity and therefore indicate a hospital's used and unused capacity. The difference between a given hospital's occupancy rate and 100% is a hospital's remaining unused capacity to serve additional inpatients.[4] The bed days used to calculate occupancy rates are based on different categories of bed counts as explained in the following description.

## Hospital Bed Categories

The OSHPD System for Integrated Reporting and Auditing (SIERA) prepares reports disclosing occupancy rates for licensed hospitals in California. The report occupancy rates are associated with three categories of bed counts: licensed, available, and staffed.[5] For the Paradise Valley Specific Plan EIR, the

[4] Ty Christensen, Health Program Audit Manager II, OSHPD, Accounting and Reporting Systems Section, email correspondence with Envicom Corporation, February 10, 2015.

[5] All three categories of bed counts exclude nursery bassinets. The licensed bed and available bed categories both exclude beds that the licensee or state may choose to place in suspense, meaning that these beds are temporarily taken out of service for various reasons such as remodeling or closure. Staffed beds are the average daily complement of beds that are set-up, staffed, equipped, and in all respects, ready for use by patients remaining in the hospital overnight. Staffed beds change daily to reflect the average daily patient census. Available beds are the average daily complement of beds that physically exist and are actually available for overnight use, regardless of staffing levels but exclude nursing units converted to non-patient care uses that cannot be placed into service within 24 hours. Licensed beds refer to number of beds stated on the hospital license at the end of

approach to assessing the adequacy of the capacity of medical service infrastructure relative to population relied upon licensed hospital beds counts because this category includes beds that could be placed into service in the future, therefore providing a measure of a hospital's long-term capacity to treat additional inpatients.[6]

## Analytic Method

The following explains the methodology used to determine the effect of an increase in service area population on hospital occupancy. Upon full buildout, the proposed project would have a population of approximately 15,707 people. The analysis conservatively added the entire population of 15,707 to the existing population of each MSSA when, in practice, the increased demand on inpatient medical facilities would likely be shared by more than one MSSA. For example, adding the project population to the MSSA associated with John F. Kennedy Memorial Hospital increases the population of the entire MSSA from 96,494 people to 112,201 people, a 16% increase. The percentage increase in the population of the MSSA associated with each hospital was then applied to the licensed bed occupancy rates associated with the three hospitals closest to the project site, thereby demonstrating what the expected increase in bed occupancy rates at local hospitals would be as a result of the proposed project.

The occupancy rate with the addition of the project population is shown in **Table 1, Hospital Occupancy Rates with the Project**, below (and in the Medical Services section of the EIR as Table 4.18-5). This future occupancy rate was calculated based on the reasonable assumption that the increase in MSSA population would be proportional to the increase in licensed bed occupancy rates. This assumption is reasonable because, based on the project description of the Paradise Valley Specific Plan, the future demographics of the community will be comparable to the existing demographics of the Coachella Valley.[7] Given this demographic similarity, one may therefore reasonably assume the increased population would use existing hospitals at the same rate as the existing population. Therefore, the percentage increase in MSSA population with the project was applied to existing occupancy rates to forecast what future occupancy would be for the three hospitals nearest the project area.

**Table 1**
**Hospital Occupancy Rates with the Project**

| Medical Facility | Existing MSSA Population [a] | MSSA Population with the Project | Increase | Existing Occupancy Rate [b] | Occupancy Rate with the Project [c] |
|---|---|---|---|---|---|
| JFK Memorial Hospital | 96,494 | 112,201 | 16% | 43.6% | 59.6% |
| Eisenhower Medical Center | 98,679 | 114,386 | 16% | 40.9% | 56.9% |
| Desert Regional Medical Center | 127,164 | 142,871 | 12% | 56.2% | 68.2% |

[a] Medical Services Study Area. Data Source: OSHPD Healthcare Atlas, January 20, 2015.
[b] Data Source: OSHPD, System for Integrated Reporting and Auditing, Financial Disclosure Reports.
[c] The occupancy rate with the project was calculated on the assumption that an increase in MSSA population is proportional to an increase in patient (census) days.

the reporting period and include beds that could be made available over time such as in cases where a non-patient unit has to be moved out to make the beds available again.

[6] Ty Christensen, Health Program Audit Manager II, OSHPD, Accounting and Reporting Systems Section, email correspondence with Envicom Corporation, February 10, 2015.

[7] This comparison has been made in the project demographic analysis, Analysis of Onsite Employment Potentials, Paradise Valley Specific Plan, The Natelson Dale Group, Inc., September 2015 Draft.

## Conclusion

Adding the increase in project area population to forecasted occupancy rates at the three hospitals nearest the project area leads to the conclusion that these three existing hospitals have sufficient remaining capacity to serve future residents of the project area. Therefore, given that nearby hospitals have sufficient capacity to serve the Paradise Valley project, the project would not result in the need for new or physically altered medical service facilities.