

Core Population Estimates
 Task Force on Department of Health Facilities
 9/22/2015

Executive Summary

Based on existing counts of core populations and future projections out to 2030, the Life Resource Center will require approximately 120 beds.

The number of beds at the State Hospital is a more complex decision that will require considering multiple factors in conjunction with the Title 25 subcommittee.

Facility Missions - Option 1(a)

Option 1(a), as recommended by the Task Force during Phase I and selected by the 63rd Wyoming State Legislature in §329(k) of Enrolled Act 56, integrates and allocates the role of the State in providing facility-base safety-net care to various populations across the Wyoming State Hospital and the Wyoming Life Resource Center.

The Wyoming State Hospital would focus on acute crisis stabilization and the Wyoming Life Resource Center would focus on intermediate and long-term care. In this option, the Wyoming Retirement Center would be privatized or closed.

Table 1: Populations and Settings for Option 1(a)

	Type of Care		
	Acute	Intermediate	Long-term
ABI/DD with exceptionally difficult behaviors			
Title 25 - Civil Commitments			
Title 7 - Forensic Psych			
Gero-psych			
High Medical			
"Hard to Place"			
"Emergency Placements"			

Key

- The Wyoming State Hospital
- The Wyoming Life Resource Center

Wyoming Life Resource Center

Mission

As shown in Table 1, the Wyoming Life Resource Center in Lander will provide intermediate care to:

- Individuals with developmental disabilities (DD) or acquired brain injuries (ABI) who manifest exceptionally difficult behaviors.

As well as intermediate and long-term care to:

- Geriatric psychiatric patients.
- High-needs medical clients.

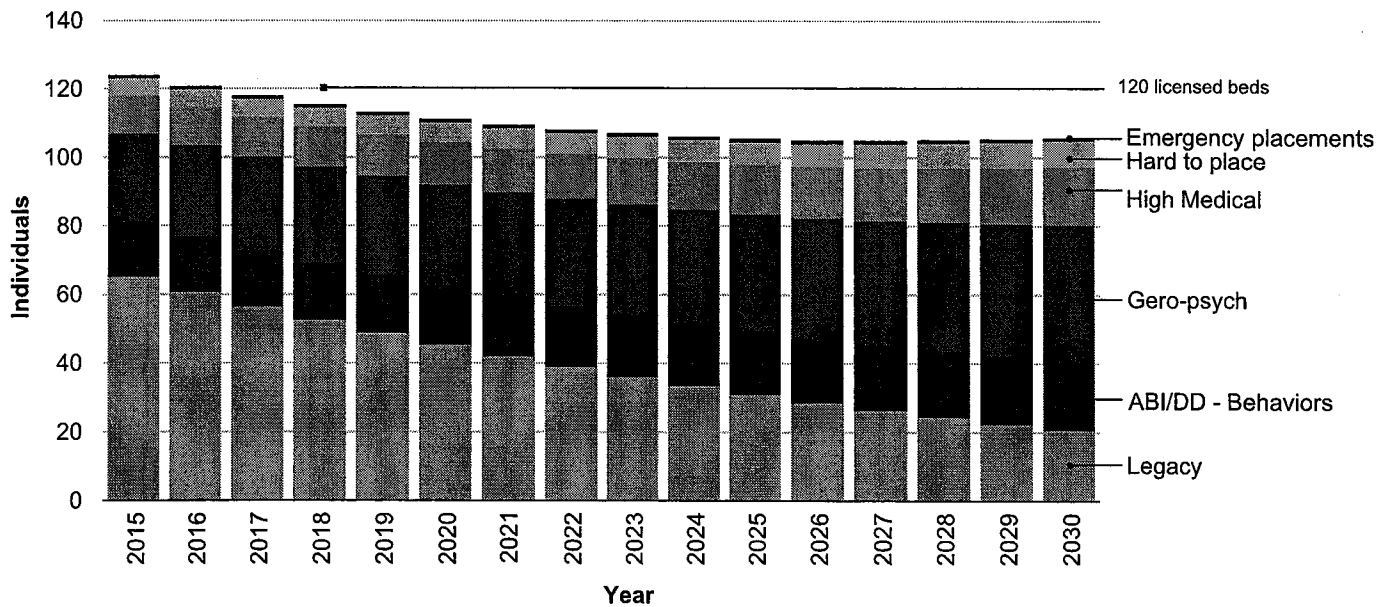
The facility will also be prepared to provide long-term care to “hard-to-place” clients as well as all types of care to emergency placements.

Additionally, there is a ‘legacy population’ of approximately 75 individuals who have lived at the WLRC for most of their lives, but do not fit the core population definition.

Projections

The Life Resource Center is projected to serve approximately 105-110 clients out to 2030, as shown in the figure below. Assuming some flexibility with occupancy, this will require approximately 120 licensed beds.

Figure 1: WLRC Projected Demand



Note that this model predicts that a declining legacy population will gradually be supplanted by growing numbers of core clients.

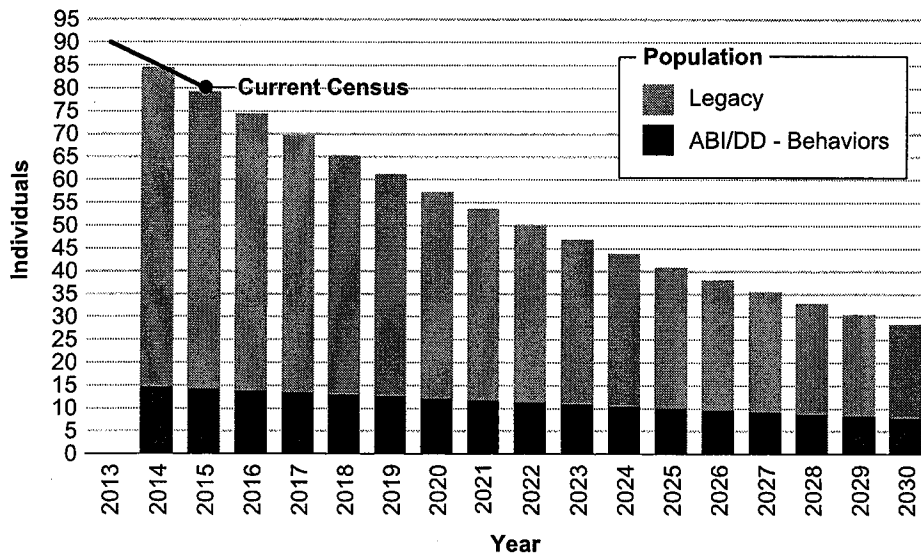
Specific populations were projected as follows:

Legacy population

Of the 80 clients currently at the Life Resource Center, there are approximately 14 clients who manifest exceptionally difficult behaviors. The remainder are considered the “legacy” population.

Figure 2, below, shows how the current census has declined for both groups since 2013, and is projected to decline to approximately 25-30 individuals by 2030.

Figure 2: Projected census for current clients - WLRC



These projections are the result of a logistic regression model constructed from Medicaid eligibility data for approximately 3,000 individuals in Wyoming with Developmental Disabilities or Acquired Brain Injuries between 2007 and 2014 (amounting to ~18,800 person-years of data). Only ages 5 and up were included in the model.

The model predicts the probability of death in any given year based on age, client type (DD/ABI/WLRC) and two ICAP subscores measuring behavioral issues (General Score) and required assistance with Activities of Daily Living (ADLs) -- the Personal Living Domain score.

Model output can be seen on Table 2 on the next page. The base group code (1) corresponds to the ABI waiver, group code 2 corresponds to DD Adult, 3 to DD Child and 4 to the Life Resource Center.

The “V157” coefficient corresponds to the ICAP Personal Living domain score and “V152” corresponds to the ICAP General score. “Agepersonal” and “agegeneral” are the interactions of these variables with age.

Table 2: Model output

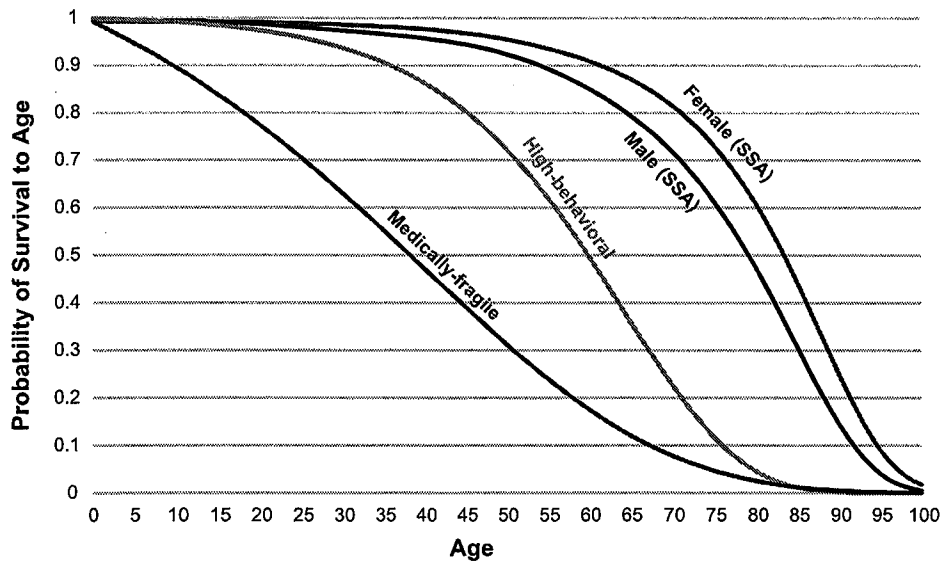
Logistic regression
 Number of obs = 18,842
 LR chi2(8) = 382.61
 Prob > chi2 = 0.0000
 Pseudo R2 = 0.1357
 Log likelihood = -1218.7841

Death	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
age	-.1278197	.0307814	-4.15	0.000	-.1881502 -.0674892
groupcode					
2	-.4713809	.197511	-2.39	0.017	-.8584954 -.0842664
3	-.678362	.3224339	-2.10	0.035	-1.310321 -.0464032
4	-.2026189	.2730957	-0.74	0.458	-.7378767 .3326389
V157	-.0302497	.0035781	-8.45	0.000	-.0372626 -.0232368
V152	.091904	.0288356	3.19	0.001	.0353872 .1484208
agepersonal	.0003881	.0000729	5.33	0.000	.0002453 .0005309
agegeneral	-.0016041	.0005574	-2.88	0.004	-.0026966 -.0005117
_cons	7.858124	1.462562	5.37	0.000	4.991555 10.72469

The coefficients in Table 2 were applied to individuals at the WLRC to calculate probability of death in any given year, with increasing age over time. This was used to predict cumulative survival probabilities, which in turn were summed for the “legacy” and “priority” populations to arrive at the totals in Figure 2.

Figure 3, below, shows how these survival probabilities for the “medically-fragile” (low Personal Living domain) and “high-behavioral” populations compare with those calculated from Social Security Administration life tables.¹

Figure 3: Predicted survival probabilities for WLRC clients vs. general US population



¹ <http://www.ssa.gov/oact/STATS/table4c6.html>

ABI/DD with exceptionally-difficult behaviors

In addition to the 14 ABI/DD clients with behavioral issues at the WLRC, there are approximately 4 at the State Hospital who would be moved to the WLRC once facilities are constructed.

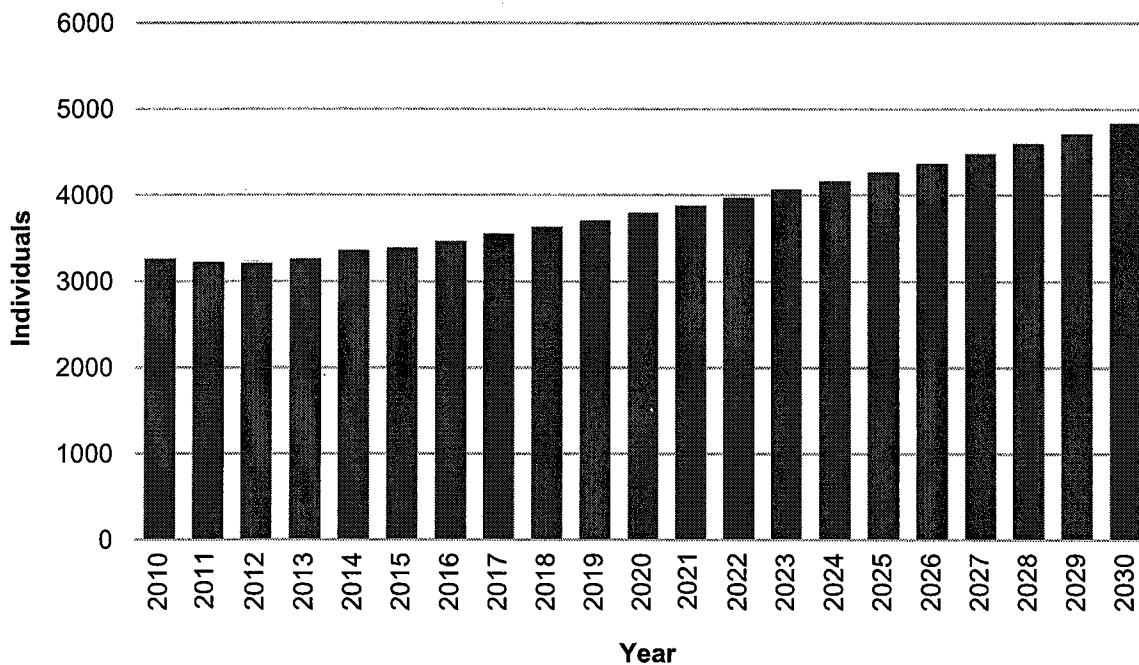
This base was multiplied by an annual 1.5% growth rate² to project estimates out to 2030.

Gero-psych

There are approximately 13 “gero-psych” clients at both the Retirement Center and the State Hospital.

This base of 26 was multiplied by the projected annual growth rate for Wyoming Medicaid’s Long-Term Care population, which varies between 2.4% and 3.5%. Projections for this larger population are shown in Figure 4, below.

Figure 4: Projected growth in Wyoming Medicaid long-term care (Skilled Nursing Facility, Assisted Living Facility, and Long-Term Care Waiver) clients



This estimate, in turn, was derived from Wyoming population projections out to 2030, as developed by the Economic Analysis Division of the Department of Administration and Information³, combined with Wyoming Medicaid eligibility data for those long-term care populations, which was used to estimate the projected probability of being a Medicaid client in a SNF/ALF/LTC setting for the 65 - 85+ year male and female demographics. These probabilities are shown in Table 3 below.

² This rate was estimated from growth in current DD/ABI waiver clients + waitlist (WDH Operational Reports data) between 2012 and 2014.

³ http://eadiv.state.wy.us/pop/AgeSex_PROJ_2040.xlsx

Table 3: Projections for probability of Medicaid long-term care

Age Band	p(SNF) Males	p(SNF) Female	p(ALF/LTC) Male	p(ALF/LTC) Female
65-69	0.41%	0.49%	0.37%	0.90%
70-74	0.75%	0.99%	0.47%	1.09%
75-79	1.23%	2.05%	0.53%	1.27%
80-84	1.96%	3.34%	0.60%	1.90%
85+	3.58%	8.96%	0.88%	2.41%

This analysis did not factor in private pay clients, or trends indicating that long-term care in home- and community-based settings will gradually displace a significant portion of institutional care.

Because it only uses aggregate growth rates over time, however, the analysis treats Medicaid clients as an indicator of future LTC demand in general, which is a reasonable assumption, given Medicaid's market share of the LTC market.

High-medical

A base of 11 "high medical" clients at the Wyoming Retirement Center was multiplied by the same estimated growth rates shown in Figure 3, above.

Hard to place

A base of approximately 5 "hard to place" clients (WRC and WLRC) was multiplied by the same estimated growth rate shown in Figure 3.

Emergency placements

One slot for emergency placement was used for the entire projection period.

Wyoming State Hospital

Mission

The Wyoming State Hospital in Evanston will provide acute care to:

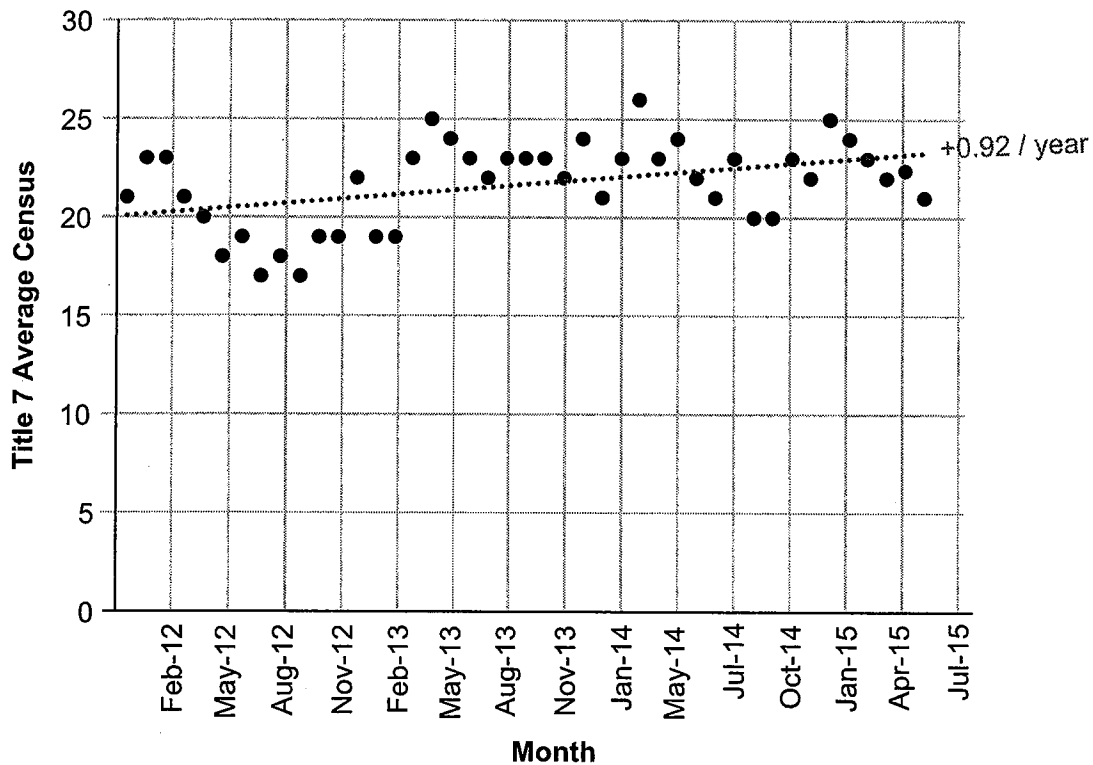
- Individuals with developmental disabilities (DD) or acquired brain injuries (ABI) who manifest exceptionally difficult behaviors
- Title 25 - Civil Commitments
- Geriatric-psychiatric

The State Hospital would also provide acute, intermediate and long-term care to Title 7 - Forensic Psychiatric patients.

Projections

Based on current trends of approximately +0.92 patients per year off an average of 23 current clients, the State Hospital will have to serve approximately 35-40 Title 7 patients by 2030.

Figure 5: Trend in Title 7 clients

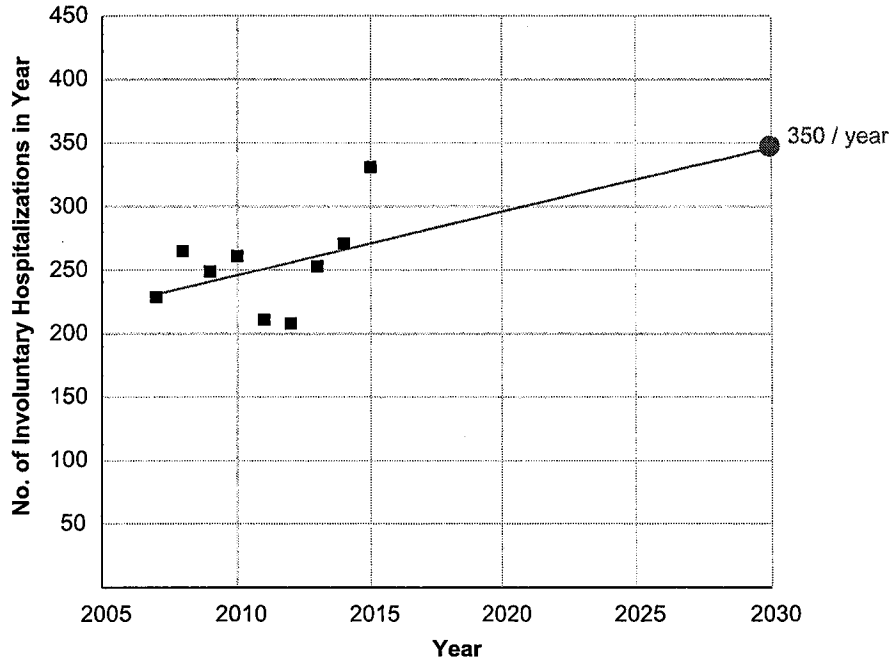


Determining the requirement for Title 25 and other acute psychiatric hospitalizations is not as simple, and will require a policy decision made by the Facilities Task Force in conjunction with the Title 25 Subcommittee.

Involuntary hospitalizations

The annual rate of involuntary hospitalizations in Wyoming over time is significantly more volatile than the Title 7 population. Figure 5, below, shows trends since SFY 2007.

Figure 6: Involuntary hospitalizations, SFY 2007 - 2015.



Note that, while SFY 2015 has seen an extraordinarily high number of hospitalizations (331 estimated by the end of June), we cannot base projections on the assumption that this rate will remain as high.

The average rate, shown by the green line, is projected to increase by approximately 5 hospitalizations per year, ending with an estimated 350 per year in 2030.

This assumes that (a) demand for IH will continue at current average rates and (b) that private psychiatric facilities will continue to be used to absorb excess Title 25s -- i.e., that the State Hospital should be built to serve average demand.

Factors influencing demand

The Title 25 subcommittee is working on ways to reduce the rate of involuntary hospitalizations. Potential options include additional crisis intervention training, funding and incentivizing additional crisis stabilization beds in the community, adding "gatekeepers", etc. All of these options have the objective of keeping individuals in the community as opposed to the hospital.

Factors influencing supply

The ability of the State hospital to respond to involuntary hospitalizations is governed largely by two basic factors:

- (1) The total number of beds.
- (2) The time it takes to turn around each bed, as measured by the Average Length of Stay (ALOS).

Where the first factor will be decided by the Task Force, the second factor depends on both the Task Force (e.g. moving long-term stays to the Life Resource Center) and the Title 25 subcommittee (e.g. having supports in the community that facilitate rapid discharge once hospitalization is no longer required).

Putting it together

The nomogram on the following page illustrates how all of these factors are linked.

- The **horizontal axis** shows the estimated percent reduction in involuntary hospitalization demand. How successful do we think we can be at reducing IHs in the State? Alternately, how successful must we be in reducing demand if we want a certain size of facility?
- The **vertical axis** (left) shows the Average Length of Stay (ALOS) required for a given facility size and estimated reduction in IH demand. If we want to maintain 75 beds, for example, and believe we can reduce IH demand by 25%, then the State Hospital will require an ALOS no greater than 85 - 90.

Alternately, if the State Hospital can only reduce ALOS to 100 days, and the Title 25 Subcommittee believes it is only possible to reduce involuntary hospitalizations by 10%, 100 - 110 beds will be required to handle demand.

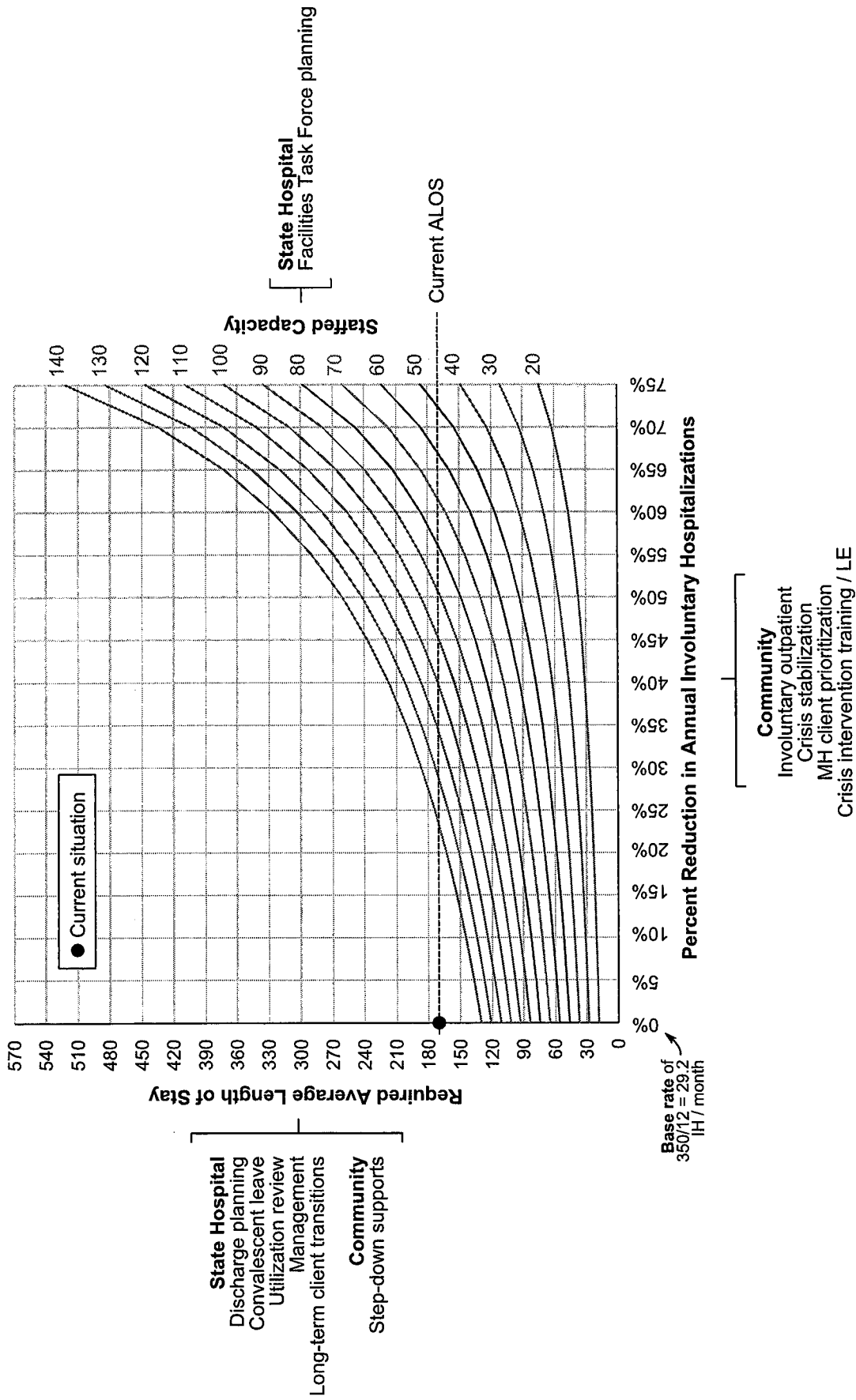
The nomogram was constructed using Little's Law; i.e, in this context:

$$\text{Total Clients at WSH} = \text{Arrival Rate} \times \text{Average Length of Stay}$$

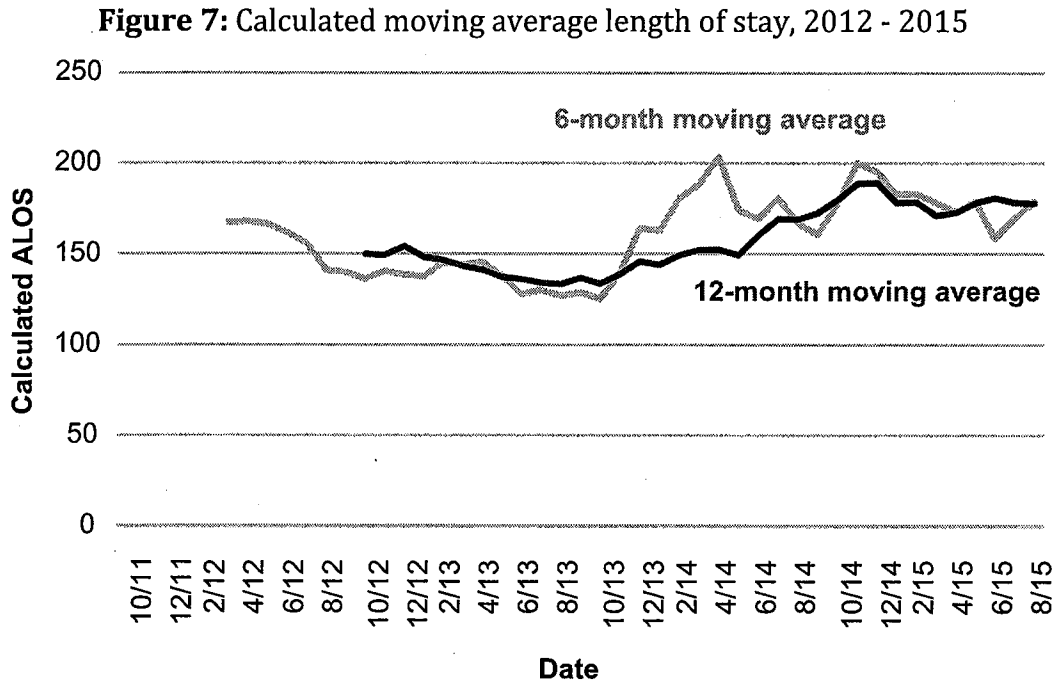
More specifically, each curve represents the relationship between ALOS and reduction in IH demand for a given bed capacity:

$$\text{Average Length of Stay} = \frac{\text{Required Bed Capacity} \times 0.9 \text{ Utilization} \times 30 \text{ days/month}}{29 \text{ IHs/month} \times (1 - \text{Percent reduction in IH demand})}$$

State Hospital - Title 25 Capacity Planning Nomogram



Current ALOS for the State Hospital was estimated at 170 from the 12-month moving average calculated from State Hospital operational reports data, as shown in Figure 7, below:



ALOS for each moving period was calculated as follows:

$$\text{ALOS in period} = \frac{\text{Average daily census in period} \times 30 \text{ days}}{\text{Average monthly admits in period}}$$

This calculation differs from the one in the nomogram because a significant number of IHs get processed at private designated hospitals due to the current bottleneck at WSH. In the future, the WSH should be built to accommodate average IH demand, not just the admissions it sees currently.

