**A NEW APPROACH TO GAUGING NEED**

Everyone in leadership roles in senior living and health care have seen countless charts demonstrating the strong projected population growth of the older age cohorts.  Of more value to policy makers and executives is "seeing" how this underlying population growth is likely to translate into local demand for various types of housing and healthcare facilities.  This information, or more precisely, this perspective, can serve as the foundation for public policy and strategic planning.

We propose a two-step framework to gauge potential demand for senior living and healthcare capital projects.   Put simply, the approach is to (i) estimate population and (ii) apply appropriate "**Unit Ratios**" to the population estimate.   "Unit Ratios" is a broad measure of senior living or healthcare units to population stated so as to encompass the applicable range of unit types.   Namely, for assisted living, memory care, independent living and senior apartments and active adult homes the typical measurement is living units (or doors); for skilled nursing and hospitals the typical unit of measurement is beds.

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Key underlying principles of our proposed approach are:

(1) **Transparent.**  Assumptions should be clearly stated and there should only be a handful of assumptions that are highlighted.  In constructing any forecast model, it is tempting to incorporate numerous adjustments requiring many new assumptions to give the appearance of presenting a more realistic and robust methodology.   In many cases, this extra complexity is of little or no incremental value in formulating a better forecast but has a very real cost of further obscuring the methodology[1].

 (2) **Appropriately Imprecise.**  At first read, this may appear to be an odd goal.   However, specious precision can and does have ruinous consequences.  The notion of planning a project that fits tightly within the confines of a detailed "unmet need" analysis is imprudent.  Nassim Nicholas Taleb in the *Black Swan* (2007) and Daniel Kahneman in *Thinking, Fast and Slow* (2011) warn their readers about the so-called "experts" offering guidance and precision inconsistent with the underlying complexity of the situation.   Both of these authors advise their readers to appropriately apply "statistical" or "probabilistic" thinking in keeping with the realities of the situation.  In practice, it seems almost impossible to avoid

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converging to a single baseline estimate for important metrics in our decision processes, but these metrics can be framed and presented in a manner that remind key decision makers of the level of uncertainty.

(3) **Grounded In Place.**  Continuing to run with the drawbacks of the "unmet need" perspective, Phil Downey and Larry Rouvelas of Senior Housing Analytics have documented how penetration rates (per typical industry methodologies) vary widely from market to market and they make a strong case for using a peer ranking methodology instead.  We agree, and would further stress that gauging demand should be grounded in historical characteristics of its particular geography.

(4) **Visual.**  McKinsey Quarterly is particularly exemplary in how it summarizes fairly detailed and complicated processes in an intuitive and visual manner that highlights not only the end result but the underlying key components and assumptions of their studies.  This is part of a welcomed trend in improving data visualization[2] that we aim to incorporate into our consulting work.

We propose a two-step framework:  (1) forecasting population and (2) determining and applying applicable Unit Ratios.

## STEP 1 – FORECAST POPULATION

Forecasting populations for older age cohorts is relatively straightforward as generally everyone that would be reflected in a reasonably near-term future forecast is alive today.  Furthermore, older age cohorts move less than younger age cohorts.

For population estimates, there are several arguments for building on US Census data.  Most major government entities base their estimates on US Census information and US Census information is available more frequently and locally via the American Community Survey[3].   New senior living and healthcare properties generally have long timelines, decently sized trade areas and are typically most appropriately built in established (vs. developing) areas.   These attributes reduce the value proposition of general third-party demographic data vendors to our industry.  The most notable critique of these third-party sources is that in many cases they are effectively "black box" forecasts with limited visibility into their underlying assumptions.

In this issue of TOPICS we are spotlighting Santa Clara Country in large part because Rockwood Pacific will be presenting on this topic at the upcoming Housing, Community & Longevity Conference on November 5th.   As home to Google, Apple and Facebook, Santa Clara County has particularly unusual economic characteristics but the forces driving their population growth in their older age cohorts have their roots in a time period when Mr. Hewlett and Mr. Packard were merely two promising engineers working out of a garage.

Accordingly, the nature of growth in demand for senior living services is likely to be similar to numerous communities.

We propose a population estimate framework that focuses on three key metrics for forecasting population: **promotion rate**, **longevity rate** and **net migration rate**. To illustrate this framework, the following analysis utilizes ten-year intervals aligning with decennial years.

For our purposes here, we'll focus on forecasting the growth in the 75+ age cohort. With regard to this assumption, there is no perfect solution and we will readily concede that the choice of this particular age breakpoint is relatively arbitrary.[4] In fact, there is an argument that now (or in the very near future) the 80+ age cohort would be more appropriate for assisted living and skilled nursing.

35% of the 75+ age cohort from 2010 are expected to live long enough (longevity rate) to be alive in 2020 and 74% of the 65-75 age cohort are expected to survive and enter the 75+ age cohort (promotion rate). This would result in the 75+ age cohort increasing from 90,000 to 112,900 (2.4% per year growth rate). Net migration is *di minimis*.
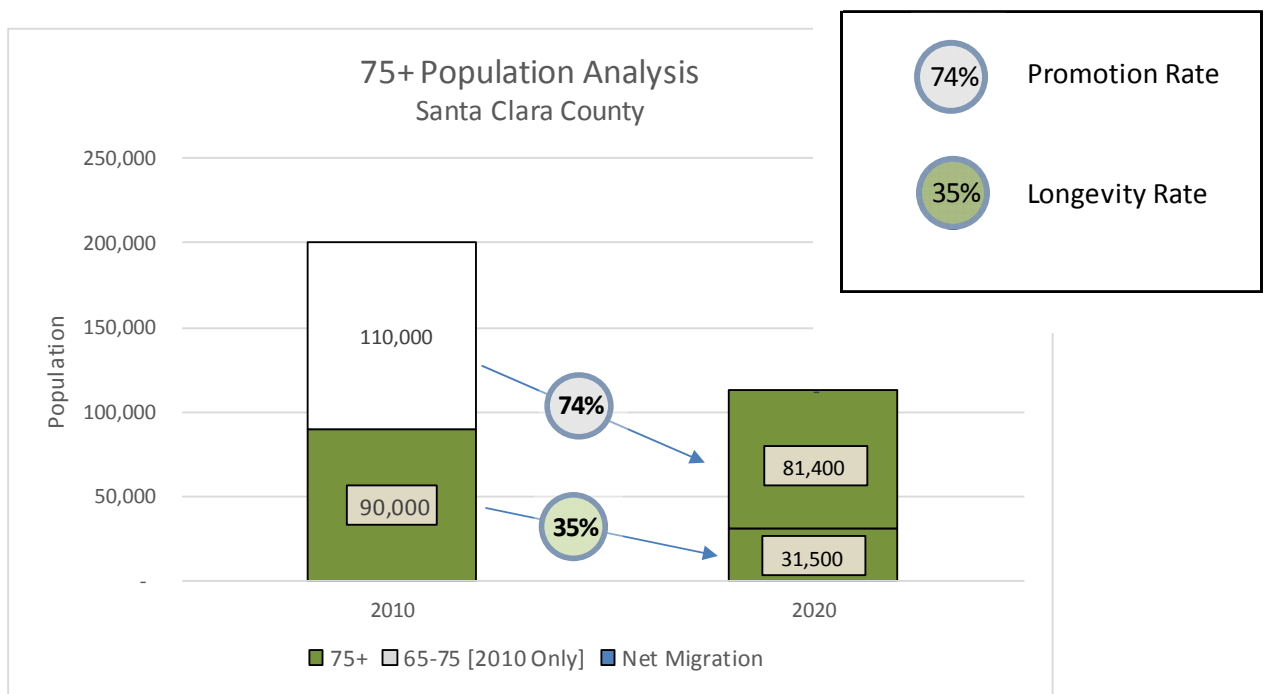


Promotion rate reflects those in the immediately younger age cohort (in this case the 65 to 75 age cohort) that are expected to graduate to the next age cohort because they are expected to still be alive after ten years. **Longevity rate** represents people that were already in the 75+ cohort, but are also expected to still be alive after ten years. For the

purposes of this analysis, **promotion rate** and **longevity rate** are merely the appropriately weighted probability that members of these age cohorts will survive ten years based on the national survival rate from the Social Security Administration. [5]  There are numerous factors that could cause these two ratios to deviate from national norms however these variations are likely to be minor, and when they are not, it is certainly an attribute of the local market that is worthy of emphasis.  **Net migration rate** is expected to be more varied from place to place, but due to relatively limited migration of older adults this is expected to be a minor factor in general and, in the case of Santa Clara County, *di minimis*.[6]

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Note that unlike typical approaches, we are not providing an income screen in the population forecast. Clearly ability to pay is an important driver of the feasibility of many projects, and we certainly advocate addressing this important economic factor in assessing the feasibility of various capital projects, but screening lower income older adults from the population statistics masks the needs of this important population.  While

> **LONGEVITY RATE represents people that were already in the 75+ cohort, but are also expected to still be alive after ten years.**

strong mission driven organizations are certainly going to apply good stewardship to their project planning processes, we believe that removing lower income seniors from the framework altogether is inappropriate.

**STEP 2 – DETERMINE & APPLY UNIT RATIOS**

The Unit Ratio definition is similar to headship ratios which correlate households to population; the headship ratio methodology has underpinned analysis of more traditional housing for decades.[7]  The basic premise is that each household correlates to a housing unit.   Unit Ratio is a generic term intended to be applied to a wide range of senior living and health care project types from active adult single family homes to hospital beds.  For reasons elaborated elsewhere, we resist the temptation to add an intermediate calculation for headship ratios or sharing ratios, and instead, define the Unit Ratio as simply the ratio reflecting the number of units (either "doors" or "beds" depending on the type of property) per one thousand older adults aged 75+.

The Unit Ratio reflects how many units (AL units, SNF beds, CCRC IL units, affordable senior apartments, etc.) have been distributed in a given location at a given time.  Starting with a national perspective, a particularly valuable analysis was undertaken by CMS in surveying Medicare beneficiaries.[8]  According to CMS's study, even in the 85+ age cohort, only 22% of

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the Medicare enrollees do not live in traditional housing. For the 65+ age cohort, only 6% of enrollees live outside of traditional housing.

In this issue of TOPICS, we have supplemented our own comprehensive database of senior living and healthcare properties with applicable state and federal records to create a supply time series of the number of independent units (either as part of a CCRC or otherwise), assisted living units, memory care units and skilled nursing beds.[9] In a future issue of TOPICS we plan to focus on affordable senior apartments which warrant a different framework.



Unit Ratio Time Series
Santa Clara County
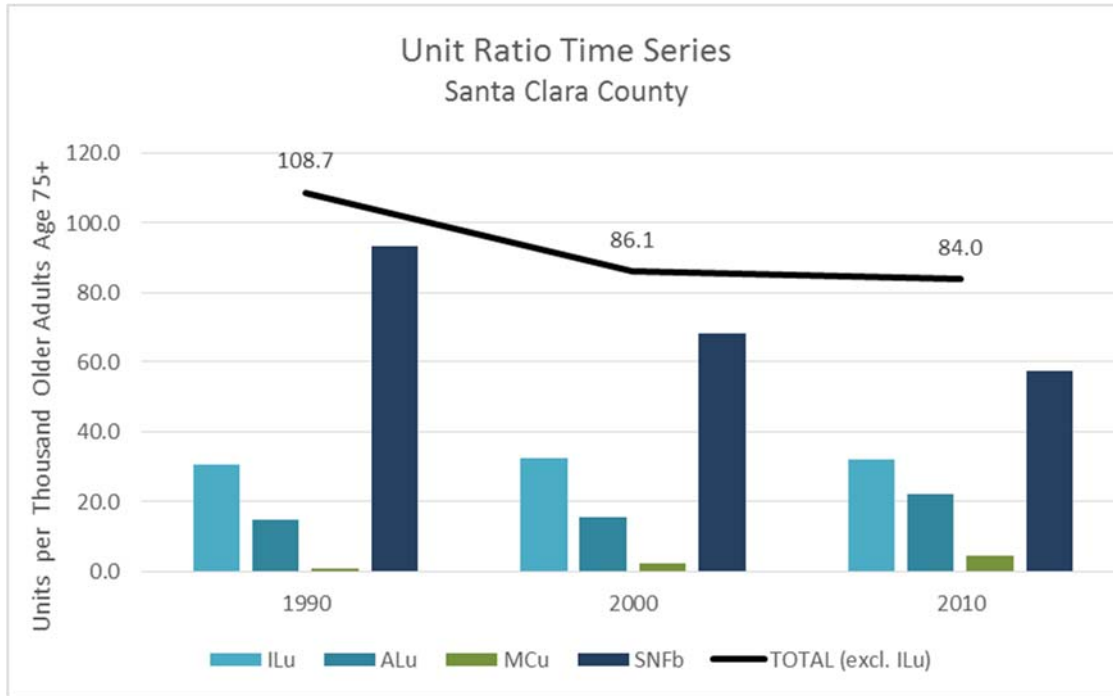
The overall Unit Ratio (including IL units, AL units, MC units and SNF beds) for Santa Clara County has declined since 1990. Changes in technology and customer behaviors and the emergence of enhanced housing alternatives may cause the overall Unit Ratio to decline further. The SNF category has lost ground to the other alternatives, particularly to AL and MC.

**ILu** independent living units; **ALu** assisted living units; **MCu** memory care units; **SNFb** convalescent /skilled nursing beds.

We do not believe that the Unit Ratios within each of the subcategories will hold constant, however, it is illustrative to see the implications of this assumption as a starting point for a strategic process to assess your capital strategy and/or policies in Santa Clara County.

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**Units by Category**
**2020 Based on Constant Unit Ratio Assumption**

| Category | 2000 | 2010 | 2020 | Increase |
|----------|------|------|------|----------|
| ILu | 1,570 | 2,382 | 2,900 | **500** |
| ALu | 752 | 1,129 | 2,000 | **900** |
| MCu | 34 | 156 | 400 | **200** |
| SNFb | 4,779 | 5,026 | 5,200 | **200** |
| Total Units | 7,135 | 8,693 | 10,500 | **1,800** |

\* Number of Units in 2020 *assuming* constant Unit Ratios.
   2020 = Unit Ratio (by category) x 2020 Population Estimate (rounded).

Data has been obtained from sources that are believed to be reliable but Rockwood Pacific does not guaranty the accuracy of the data and is not liable for outcomes of the data used.

Some existing units may be adapted to another use due to obsolescence, but older communities rarely shut down and are either repositioned/renovated or serve populations with lower means than initially targeted.

Within each age specific cohort, we believe that the net effect of the factors discussed below will cause demand growth to be lower than the "reference" demand figures above. In other words, the net effect of various forces outlined here are expected to continue to drive down Unit Ratios over time.

Generally, the following factors will be major drivers of change in these ratios over time:

**1.  +/- Unmet Demand/Over Supply.**
Assuming that a market is currently out of equilibrium and has unmet needs can be an overly aggressive assumption.  After all, a key attribute at play here is that everyone is already residing somewhere. Unlike inventing a brand new service offering, in this realm, someone needs to

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move from somewhere to occupy a new unit in a new project.  At a minimum, markets with unmet demand should exhibit either extraordinarily high occupancy rates or growth in rates (or both).

**2.  +/- Change in Need for Services.**  According to the Stanford Center on Longevity and the Center for Disease Control,[10] it is generally expected that for any given age cohort, the need

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for services will decline rather than increase, contributing to a decline in the Unit Ratios. Notable exceptions to this trend are increases in prevalence of adult autism[11], diabetes[12], high blood pressure[13] and obesity[14]. There is less clear evidence that, within specific age cohort categories, the incidence of dementia is changing.[15] However, absent significant scientific progress in this field, population growth in the older age cohorts will continue to drive growth in demand for memory care communities.

**3.  +/- Age Distribution.**  Over time, the distribution of ages within the 75+ age cohort will change as a greater portion of this category is composed of seniors age 85+ and even age 100+.  Because of this trend, a rigorous analysis should delve down to single year age cohorts (e.g. 77 year olds) but per our prior comments, care must be taken not to introduce complexity that does not yield proportionate improvements in results.   We propose that this be treated as a side calculation yielding an appropriate adjustment to the applicable Unit Ratio as defined here.  We readily concede that other approaches to addressing this change in age distribution can be equally valid, but we recommend this approach in keeping with our goal to keep the framework intuitive and clear.

**4.  +/- Income/Wealth.**  Similar to changes in age distribution, there are multiple valid approaches to addressing changes in income and wealth, but again, we propose this be treated as a side calculation to be brought back into the Unit Ratio framework.

**5.  +/- Substitution Effect.**  This is basically the underlying force in the rapid growth of Sunrise Senior Living properties and high-end rental assisted living/memory care properties in general (we refer to this as the "Sunrise Model").  The Sunrise Model provided a more residential alternative to SNF that was perceived by many to be a stronger value proposition.  In effect, the entire AL category has realized a positive substitution effect at the expense of the skilled nursing category.  We believe that in many markets that substitution effect has run its course and that going forward new and improved skilled nursing offerings will maintain market share (in other words, the Unit Ratio for SNF is not expected to continue to fall as much as it has in the past).  Building housing and healthcare communities that are *more residential* has been a winning formula across all senior living and healthcare categories and improving the value proposition is a winning formula across all industries.   Accordingly, as technology and culture evolve, single family homes and enhanced services apartment are likely to take market share from other categories.  Other forces affecting substitution are broader trends in culture, public health policy and private insurance markets.

In addition to the forces outlined above, a more technical factor is the potential for spill-over[16] effects to and from adjacent geographies.

## PUTTING THE TWO STEPS TOGETHER -> GAUGING DEMAND

Starting with a population growth estimate which is relatively straightforward and highlights the key metrics and assumptions for (1) **promotion rate**, (2**) longevity rate** and (3) **net migration rate** and next applying Unit Ratios that are grounded in historical experience but adjusted by the five primary factors discussed above, we generate a new view of expected growth in demand.  We are putting a heavy load on these ratios and gauging these adjustments requires a high degree of judgment and should be treated as a variable with a high level of uncertainty but one that is grounded in, and compared to, local, historical experience.   It will be appropriate to increase and decrease various ratios but there is good reason to believe that all existing traditional categories in aggregate will decline as technologies and services make traditional housing a more viable alternative for a longer period of time.  Fortunately with the strong growth in the underlying population the net effect should usually be positive.

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Incidentally, we are not advocating that traditional measures be abandoned.  Traditional measurements are relatively easy to calculate and have the advantage of familiarity to decision makers.

## STRATEGIC IMPLICATIONS

While this proposed framework could serve as a foundation for evaluating a specific capital project, we recommend it can also serve as a foundation for setting public policy priorities and guiding strategies for mission-based organizations.   This framework puts an emphasis on the substitution effect,[17] and more ambitiously, is intended to encourage all decision makers to think "more statistically".

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The "best senior living is yet to be invented" is a nice sounding slogan but the implications are serious.  Rather than "more of the same" we recommend that strategic planning efforts incorporate a thorough discussion and analysis of existing, emerging and possibly completely new offerings.   The difference between being on the positive side of the substitution effect and the negative side of this effect may be the difference between success and failure.

-- *Frank & Susan Rockwood*

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## ABOUT ROCKWOOD PACIFIC

Rockwood Pacific is a professional real estate services firm serving mission-based organizations committed to advancing wellness and longevity for older adults through better housing and better healthcare.   We provide decision support, development services, financial advisory, and real estate transaction services to our clients.

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**ENDNOTES**

[1] One notable example is the relatively common practice of "grossing-up" the demand metrics in the primary trade area in the calculation of a penetration rate to account for demand from outside the primary trade area. Typically, the same factor (representing the portion of demand from within the primary trade area versus the portion of demand from outside the primary trade area) doesn't change from location to location. Assuming consistent application across different geographies, this additional step adds little value yet it reduces the effective transparency of this particular metric.

[2] Additional recommended reference material for data visualization are two recently published books by Nathan Yau, *Visualize This (2011) and Data Points (2013).*

[3] The creation and implementation of the Public Use Micro Data Sample Area geographic level has substantially improved the utility of US Census information for studying relatively smaller areas over relatively shorter time intervals.

[4] On a rather technical note, we believe that the "age cohort pyramid profile" above age 65 does not typically vary much from location to location within western U.S. urban markets. For instance, if the *ratios* of the populations for 65-75 to 75-85 and 75-85 to 85+ age cohorts were relatively consistent, then the choice of cut-off is not material so long as results are grounded in a relative and historical perspective.

[5] Both the **promotion rate** and **longevity rate** are based on national mortality tables maintained by Social Security http://www.ssa.gov/oact/STATS/table4c6.html. For example, to determine the **promotion rate**, determine what portion of the population for each of the single year age cohorts will survive ten years. For example, for someone who was 67 in 2010, they would need to survive going from 67 to 68, then from 68 to 69, and so on until they reach 77. Weighting the calculation by gender, based on the previously referenced mortality table, this 67 year old has 79% probability of celebrating his/her 77th birthday. In rolling up to an average into our 65-75 age cohort, it is necessary to weight the calculation by the distribution of the population in each of the one-year age cohorts (this one-year age cohort data was available from the California Department of Health Services, EPIC Branch). In this case, our estimate for the 75+ age cohort in 2020 is within 0.3% of the estimate prepared by the Demographic Research Unit of the California Department of Finance.

[6] According to a database established and maintained by the Applied Population Laboratory of the University of Wisconsin, net migration for the 75+ age cohort in Santa Clara County peaked in the 1950's, declining to virtually no net migration in the 75+ age cohort in the 1980's and more recently has remained low.

[7] The headship ratio was is part advocated by Prof. Ken Rosen of UC Berkeley back in the late 1970's; Professor Rosen has quipped on several occasions that increasing divorce rates have a positive effect on housing demand growth as increasing rates of divorce result in lower headship ratios.

[8] CMS Beneficiary Survey, 2007.

[9] These categories are mutually exclusive. For instance, even though memory care units fall under the same licensing category as assisted living units in California, the memory care unit counts are not included in the assisted living unit counts. In several cases, there is ambiguity in the allocation of units between the AL and IL categories as several operators will market licensed AL units as IL permitting the resident to age-in-place as their service needs increase.

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[10] New Realities of an Older America, 2010 Stanford Center for Longevity.

[11] According to the Foundation for Special Needs Housing, the incident rate for autism has grown from 1 in 10,000 to about 1 in 150 in the last 25 years. Providing care to adults with autism does not currently fall within the realm of aging services, but as this population grows and ages we expect that aging service providers and policy makers will give this area greater attention.

[12] New Realities of an Older America, 2010 Stanford Center for Longevity.

[13] Ibid.

[14] Center for Disease Control and Prevention, National Center for Health Statistics, National Health and Nutrition Examination Survey.

[15] *Trends in the incidence and Prevalence of Alzheimer's disease, dementia and cognitive impairment in the United States*, Alzheimers Dement. (2011) Walter Rocca et. al.

[16] Spill-over effects is the flip side of leakage effects and essentially addresses the interactions between geographic areas. In many cases, these geographic areas are political entities such as counties and cities but they can also be customized trade areas.

[17] Substitution is part of the (Michael) Porter five forces analysis framework with the other forces being suppliers, customers, threat of new entrants, and competitive rivalry. The reader may have already detected a trend in the publication of Michael Porter citations. As a capital strategy consultancy, positioning is a particularly important aspect of our strategy advice and Prof. Michael Porter is arguably the most important contributor to this branch of strategy.