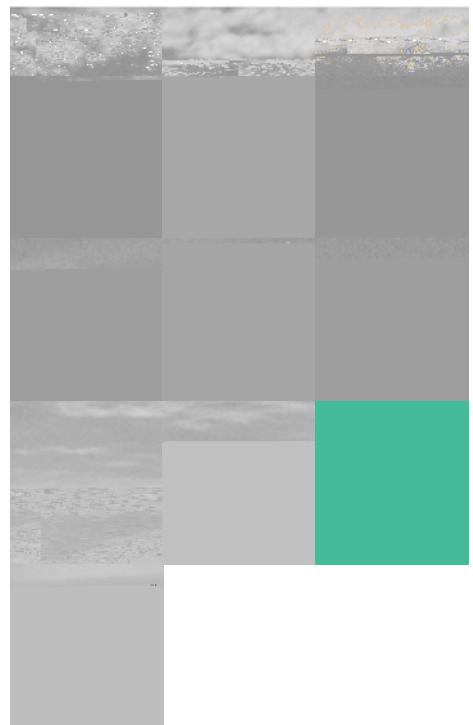# FO
COLLEGE ENR

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In the following report, Hanover Research examines best practices for devel   ment forecasting models for community colleges   assesses model variables and forecasting tools a   models used by institutions across the United St

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Figure 1.1: Applications for Enrollment Forecasting Across an Institution

Student Recruitment[5]	Enrollment projections can statistically identify likely students (by demographics, location, program of study, GPA, etc.), as well as identify and target high schools with high populations of likely students.
Enrollment Management[6]	As a key aspect of enrollment management, projections use demographic, labor market, and student demand data to predict the state of the economy (which often correlates with increases and decreases in community college enrollment).
Budget Predictions[7]	Enrollment projections should be a key consideration during strategic long term budgetary planning. It is important to use a quantitative model, document assumptions, examine existing plans, account for uncertainty, and regularly evaluate and adjust the forecast.
Capital Outlay Needs[8]	While operating budgets typically require two years of enrollment projections, 10 year enrollment projections are essential to make necessary long term decisions about new campuses, centers, and other physical spaces.

FORECASTING MODELS

Community colleges across the United States use a variety of forecasting models to determine long term projections for enrollment. Some institutions recommend a combination of models, while other institutions explore different models over time. According to the Association of Institutional Research (AIR), there are nine categories of enrollment forecasting models. A college's choice of which model to use depends on "the availability of data, user skills, appropriateness of method, cost, and usability of the software packages."[9] Figure 1.2 on the following page summarizes these nine models and their salient characteristics.

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[5] "Possibilities for Improving Student Success Using Predictive Analytics." The RP Group, September 2014. p. 5 6. http://rpgroup.org/system/files/Predictive%20Analytics%20Environmental%20Scan_FINAL.pdf

[6] Ibid.

[7] "Best Practices in Community College Budgeting." Government Finance Officers Association. p. 3. http://www.gfoa.org/sites/default/files/u36/1B 2014.07.01.pdf

[8] "California Community Colleges Long Range Master Plan." California Community College Chancellor's Office, 2016. p. 18. http://californiacommunitycolleges.cccco.edu/Portals/0/Reports/MasterPlan_2016_ADA_Final.pdf

[9] "An Integrated Enrollment Forecast Model." *IR Applications*, American Institutes of Research, (15), January 18, 2008. p. 3. http://files.eric.ed.gov/fulltext/ED504328.pdf

Figure 1.2: Nine Categories of Enrollment Forecasting Models

MODELS	DESCRIPTIONS
Subjective Judgment	When objective measures are not available, qualitative research of current trends and estimates of influential factors and future events can help predict general enrollment trends.
Ratio Method	This method predicts future first year enrollments by examining historical and projected high school graduation data.
Cohort Survival Study	This model predicts retention rates by examining the ratio of returning students in a single cohort. It can be extended to predict future enrollment.
Markov Transition Model	By tracking enrollments from one year to the next, this model "predicts the probabilities of future occurrence based on currently known probabilities."
Neural Network Model	Running this analysis for one variable can "train" the model to predict enrollment across basedc(trends.)Tj/TT174Tf.34730TD.0015Tc0030003

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community colleges. The study found that all three models were at least fairly successful at predicting future enrollments for these institutions. In the end, the study did not recommend one particular model as being the most effective but instead noted that **when accuracy is the same, institutions should choose the least complex model to simplify an already potentially complicated process.**[17]

CASE STUDY: PREDICTING STUDENT HOURS

As a part of a larger strategy to accurately predict enrollment for community colleges across the state, the California Community College Chancellor's Office (CCCCO) de[5cirly

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SECTION II: ENROLLMENT PREDICTION VARIABLES

In this section, Hanover examines notable characteristics used to predict enrollment for community colleges. The section analyzes the value of economic indicators and the use of multiple variables. The section also assesses the models and characteristics used to evaluate and project enrollment for particular student subgroups, including stopout students.

ECONOMIC

Yavapai tracked the accuracy of its enrollment forecasts since its first projection of the 2005 2006 academic year. Figure 2.2 displays the accuracy of enrollment projections for the first six years of forecasts.

Figure 2.2: Accuracy of Yavapai Enrollment Projections

Year	Forecasted FTSE	Actual FTSE	Error
2005 06	3,342	3,351	0.003
2006 07	3,540	3,617	0.020
2007 08	3,799	3,691	0.029
2008 09	3,838	3,921	0.022
2009 10	3,984	3,920	0.016
2010 11	4,086	4,205	0.029

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Other variables to predict student persistence at community colleges can also be leveraged to prevent stopouts and integrated into enrollment projections. A 2015 study from consulting firm Ruffalo Noel Levitz identified a number of satisfaction variables that had either a positive impact on spring to spring retention or could help predict retention at community colleges (see Figure 2.4).[44]

Figure 2.4: Satisfaction Variables for Community College Students

Satisfaction Variables that Predict Retention	
ƒ Satisfaction with the relationships between students and campus staff. ƒ Satisfaction with the college culture.	ƒ NOT

SECTION III: ENROLLMENT FORECASTING MODEL PROFILES

In this section, Hanover profiles

METROPOLITAN COMMUNITY COLLEGE

Metropolitan Community College (MCC), located in Kansas City, Missouri, uses a linear regression model with SPSS software to predict enrollment across its five campuses. The model

Figure 2.5: Methodologies and Limitations for MCC Enrollment Forecasting Model

	METHODOLOGY	LIMITATIONS
1	Normalized tuition using per capita income and MCC in district credit hour rate by dividing the credit hour for that year by the average per capita income and multiplying the credit hour rate for 2011.	The model can only use **independent variables** that are available for future and historical values.
2	Normalized tuition using the consumer price index and MCC	

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