



# Metro™

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY  
LOS ANGELES CONSTRUCTION  
MARKET ANALYSIS



Leland Saylor  
Associates  
A Certified DVBE

September 24, 2013

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MARKET ANALYSIS**

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LOS ANGELES COUNTY METROPOLITAN  
TRANSPORTATION AUTHORITY  
Contract Administration Department  
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## Project Background, Objectives and Scope

Background: Los Angeles County Metropolitan Transportation Authority (LACMTA) noticed a significant upward trend in project bid costs starting in the mid 2012 timeframe. To better understand the factors influencing bid costs, LACMTA engaged Leland Saylor Associates to perform a comprehensive market analysis to explore factors influencing construction cost in the 2011, 2012, and 2013 timeframe.

The primary objectives of this construction market analysis are to gather information in order to:

- Evaluate the international/national/regional/local economy as it relates to construction cost and bidding trends
- Evaluate the current and future amount of construction activities in the project region and measure its impact on the proposed work in the region
- Evaluate macroeconomic employment trends and skilled labor availability
- Evaluate current trends in bid prices versus engineer's estimates and number of bidders in the region
- Evaluate LACMTA specific contracts, processes and procedures that may influence construction bid prices

The desired outcome of the study is to better understand the factors influencing construction cost in the Los Angeles infrastructure market, develop pricing projections for future forecasts, and determine potential solutions to mitigate rising bid prices.

### Methodology:

Leland Saylor Associates utilized extensive research of print and electronic media to develop our analysis of construction activity, employment trends, and bidding trends. Resources used for this study included:

- Federal economic indicators, such as Bureau of Economic Analysis, Bureau of Labor Statistics, Bureau of the Census, and the Department of Commerce
- State of California Economic Development Department
- Engineering and construction websites, including Associated General Contractors (AGC) & Engineering News Record (ENR)
- Business and Trade Journals
- Lead tracking services, such as Reed Construction Data and Dodge Reports
- Newspaper and magazine articles

## Interviews

Interviews with contractors currently bidding or working on LACMTA work were conducted via telephone. The survey consisted of questions on a variety of issues that can affect construction cost, including:

- Recent trends in labor and material costs and availability
- Profit and overhead trends
- Bidding trends
- Escalation forecasts
- LACMTA specific contractual conditions
- Project delivery methods
- Perceived risk, both industry specific and LACMTA specific
- Contracting and hiring goals
- Labor relations practices
- Recommendations to reduce cost/risk

In addition, interviews were conducted with relevant owners in the region, including Caltrans, Port of Long Beach, San Diego Association of Governments (SANDAG), and San Bernardino Association of Governments (SANBAG).

## Independent Assessment of causes of price increases

In addition to public and private online data, bid data, and interviews, Leland Saylor Associates also reviewed the LACMTA contract and general and special conditions to assess any significant issues that could potentially affect bid pricing.

Using all the available data produced from external sources, interviews and internal review, Saylor developed its own independent analysis of the most likely reasons for the recent bid increases and possible measures to mitigate future cost increases.

## I. Executive Summary

### A. Key Points

#### i. Key Findings Having Significant Impact on Construction Costs in the Los Angeles Infrastructure Construction Market

##### **Economic, labor and spending trends indicate recovering construction economy**

Examination of key economic indicators (Gross Domestic Product (GDP), employment, construction employment and construction spending) all point to a recovering market. In the California and national market, this effect is moderate; the recovery in the Los Angeles construction market has been more rapid. Both nationally and locally, the construction recovery has been led by rising home prices, resulting in increased residential spending. Locally, from 2009 to current, construction starts have increased 30%, while construction employment is currently at 2009 levels. Employment in heavy civil category, however, has increased by 19% in the past two years, leaving employment in that category only 7% under the peak in 2007. It is likely the effect of the recovering market is contributory to the price increases experienced by LACMTA in the 2012-2013 timeframe.

##### **Bidding trends analysis**

An analysis of 111 infrastructure bids in the 2011-2013 timeframe indicate on average, bids received were 12% under engineer's estimate in 2011, 13.5% under engineer's estimate in 2012, and approximately 3% under estimate in 2013. By contrast, LACMTA's bids (excluding projects under \$3 million) were 6% over engineer's estimate in 2012 and 33% over estimate in 2013 (only two projects over \$3 million bid in 2013, thus too small to predict trends). The trend in 2013 for bids closer to the estimate is evidence the market is becoming less competitive and more balanced. This trend is magnified in the Metro bidding pool.

##### **Contractor Survey**

While our data points to a recovering market, most contractors did not cite a tightening in the market as a reason for rising prices to LACMTA. Most contractors surveyed believed LACMTA had a higher risk profile than is industry standard, and this could be a contributory factor in higher prices at LACMTA. Interviews indicated the greatest possibility of risk came from unforeseen conditions and delays in third party approvals. This risk is compounded by the change order process, which many indicated can take six to seven months or even longer for approved change orders.

Other factors cited were more complex administrative requirements and higher than normal insurance and bonding requirements, including clauses for unlimited liability and consequential damages.

Contractor suggestions for reducing cost were:

- Continue to reduce risk of unforeseen conditions with advanced utility relocations
- More robust cooperative agreements with Caltrans and City and County of Los Angeles to lessen risk of delay due to third party approvals
- Improving the change order processing procedure to reduce delays in payments of approved changes
- Escalation clauses on select materials to reduce risk of escalation
- Split large transit programs into smaller packages
- Review unlimited liability and consequential damages clauses

#### **Independent Analysis of Causes of Price Increases**

Our analysis indicates the four major causes of price increases at LACMTA are:

- The recovering Los Angeles construction economy
- Specific LACMTA requirements, processes and procedures
- Size of the LACMTA program
- Tendency for mega projects to exceed budgets

#### **Recovering Los Angeles Construction Market**

The recovery in the construction industry is increasing bid prices in 2013, and this effect is magnified in the LACMTA bids, both in increases in bid prices and reduction in the number of bidders. While labor and material increases are stable at 2-3%, 2013 marks the end of the hyper competitive market evidenced in 2009-2012. The enormous increases in productivity during the recession, along with very low margins, are now beginning to revert to more normal productivity and margins. Independent analysis indicates the recovering market, coupled with specific LACMTA conditions, policies and procedures, are the primary factors in rising costs in the LACMTA pool.

#### **Size of the LACMTA Program**

However, another factor not mentioned by contractors which may be having a significant effect on the LACMTA bids, and is likely to become a more urgent concern in the 2014-2017 time frame: the size of the LACMTA “30/10” plan. Examinations of LACMTA’s yearly capital expenditures indicate LACMTA capital spending has increased 33% from 2011 to 2013. A possible contributory effect on LACMTA’s increase in bid prices may be the contractor pool familiar with bidding LACMTA work is becoming more saturated as a whole. Supporting this conclusion is the employment data for heavy civil construction in Los Angeles: an increase of 19% in the last two years, which greatly outpaces overall employment growth in Los Angeles as well as general construction employment growth.

Currently (to a lesser degree), LACMTA is “making its own market”; i.e., the biggest competition for resources will come from LACMTA itself; and this effect will likely become even more evident as larger increases in the program put more pressure on resources in the 2014-2017 window. This effect may be exacerbated by the additional pressures of the growing housing market, potentially siphoning off laborers and carpenters.

Moving into the future, LACMTA anticipates a staggering \$13.9 billion in construction spending from current to 2019. This is equivalent to 1.5 times Caltrans’ entire annual capital outlay. Rarely are transit programs of this magnitude performed in such a limited geographical area in such a short period of time, so it’s difficult to predict the extent to which this may affect bid prices. However, with approximately \$5 billion of work being let in the 2013-2015 timeframe alone, we believe there is a strong possibility, similar to spikes in the 2004-2006 economy, LACMTA may experience spikes in bid prices far in excess of labor and material increases in 2015-2017, possibly as early as 2014.

While there is currently an excess of available labor in California, the excess capacity shown in the Los Angeles is much less, especially in the heavy civil category. Many construction workers retired or left the industry, so the 20% differential in the LA labor market from the peak to today is somewhat illusory. Statewide, the available capacity is much greater, so much will depend on the infusion of labor resources from other areas, and how quickly that could occur.

#### **LACMTA Specific Requirements, Processes and Procedures**

While Saylor has not conducted any kind of audit on LACMTA specific conditions, contractor interviews indicate the pool perceives LACMTA projects generally contain more risk than is industry standard. Greatest areas of risk noted were unforeseen conditions, delays in third party approvals, not being compensated for those delays, and delays in change order processing if the changes are approved. In addition, LACMTA is viewed as having higher administrative burdens than the general infrastructure community, including the Project Labor Agreement (PLA) and upcoming changes to Disadvantage Business Enterprises (DBE) program.

#### **Mega Project Risk**

Although mega projects bid in the 2009-2011 timeframe generally came in under engineer’s budget, mega projects (\$600 + million) have a long history of exceeding their budgets. Several mega projects bid in the 2012-2013 timeframe (Metro Crenshaw, SF MUNI 3<sup>rd</sup> Street Light Rail, Transbay Transit Center) exceeded engineer’s estimates, with the common denominator that they were all in dense urban corridors. The risks inherent in construction are magnified in large, complex, multi-year programs, and the possibility could exist that contractors are more sensitive to these risks than agencies and engineers, and price the risk premium into their bids.

### Forecast of future price increases

While we expect labor and materials to rise in the 3-3.5% range in the 2014-2015 timeframe, spikes in bid pricing may exceed that growth, depending on constraints in labor. These spikes are a result of lower productivity due to newer workers entering the market, coupled with both contractor and subcontractor margin growth due to lack of competition. In such spikes, bid prices can increase 9-10% per year, as evidenced in 2005-2006 Turner Building Index, and even higher, as evidenced by the Caltrans Historical Price Index 2004-2005 timeframe.

Therefore, we recommend LACMTA to update its current database and estimating methodology to reflect current prices being received by LACMTA; add a minimum of 3.5% per year for labor and material escalation, and build in a market contingency for price spikes likely to occur during the 2014-2017 window. Further recommendations are as follows:

## B. Recommendations to Reduce Potential for Cost Overruns

### Review estimating methodology and unit costs to reflect Metro current environment and the general recovering construction market

As many of LACMTA's bids are exceeding estimates, Saylor recommends a review of the LACMTA estimating methodology to ensure it captures cost drivers in the current economy as well as any cost impacts of Metro specific conditions and processes. Our understanding is that most engineers providing estimates to LACMTA currently include 5% design contingency; for the complex rail projects, LACMTA may consider raising design contingency to account for scopes of work (such as systems) that are generally only performance specifications in the proposal documents.

### Independent third party estimates and reconciliations on larger projects

On larger projects, many owners have independent third party estimates in addition to the engineer's estimate, and have the two estimates reconciled. This often identifies differences in interpretation of scope, areas that are unclear, and sheds light on assumptions made by the estimators. We recommend that LACMTA program management to institute full, independent third party estimates with reconciliations on all larger projects well in advance of bidding to identify potential cost overruns, and if needed, institute value engineering procedures to bring the project within budget prior to bid.

### Include formal risk analysis procedures with Monte Carlo simulation on all projects over \$100M.

LACMTA projects, especially large multi-year programs, can multiply common construction risks. The risks should be assessed by LACMTA personnel familiar with common risks on LACMTA work. Additional risks include the potential of a rapidly rising construction market. If appropriate, LACMTA may want to add a risk contingency to the estimate.

**Review contractual conditions for fair allocation of risk, appropriate liability requirements, and industry standard insurance requirements**

Although Saylor has not performed a contract audit, contractor interviews indicate that they perceive contractor risk, requirements (on some projects) for unlimited liability, and insurance limits to be higher than industry standard, adding to cost. We recommend a review of current contractual conditions to assess cost impacts.

**Review change order procedures, focus on staffing to accommodate coming demand in 2014-2019**

Contractors mentioned delay in processing changes to be a significant risk in LACMTA construction. With \$5 billion in work beginning in the 2013-2015 window, there will likely be increasing demand on the change management function. Even in the best run projects, change orders due to unforeseen conditions are inevitable, and delays in merit determination and payment of approved changes can increase contractor risk and costs. Saylor recommends a review of current change management procedures, and incorporation of industry best practices to streamline the process. To accommodate demand, it is recommended that LACMTA review staffing levels to assure adequate staffing of the change management function, and possibly establishing metrics for timely processing of changes.

**Continue efforts to provide advance utility relocation packages**

One of the largest risks perceived by the LACMTA contractor pool includes the potential of unforeseen condition costs due to utility relocations. The contractors perceived that LACMTA was trying to address this risk with advance utility relocation packages.

**Establish more robust cooperative agreements between Caltrans, City & County of Los Angeles**

The other significant perception of risk was the potential for delay due to third party approvals. Contractors perceived that more cooperative agreements between agencies would reduce risk, and therefore, has a potential to reduce cost.

**Ensure DBE goal established for large projects reflects the amount of DBE's in the market place ready, willing, and able to take on Metro work**

The current program shows \$5 billion in contracts being let in the 2013-2015 timeframe. The goal should consider how many DBE's are certified, can bond, and perform work in this timeframe. If goal outpaces available DBE's, this could impact costs.

**Continually assess labor demand; review PLA hiring practices to ensure adequate labor exists to meet goals**

The PLA will facilitate training of apprentices to accommodate demand. Continue to proactively work with unions and contractors to ensure labor exists to meet 2015-2019 demand. Should the economy continue to improve, review implementation of the hiring goals to assess added costs, if any, to the program. .

### **Review Metro staffing levels to match resources to size of projects**

The demands of managing \$13.9 billion in construction 2013-2019 may outpace current LACMTA staffing. Additionally, the complexity of the LACMTA program requires a high level of skill and the ability to push through approvals with other agencies to accomplish timely completion. The ability to hire and retain highly skilled project managers and support staff is integral to the success of any large building program. The Associate General Contractors is reporting that selected markets are showing difficulty in hiring skilled staff, including engineers and supervisory position, and every effort should be made to recruit and retain skilled project management staff to run and manage the complex projects in LACMTA's 30/10 plan.

### **“Embrace partnering on all levels” (Quote from contractor survey)**

Contractors indicated that agencies that have a partnering mentality will garner the most competitive bids. They perceive partnering as assisting the contractor to resolve issues, assuming appropriate risk for unforeseen conditions, processing merited changes quickly, and partnering with other agencies to ensure timely approvals.

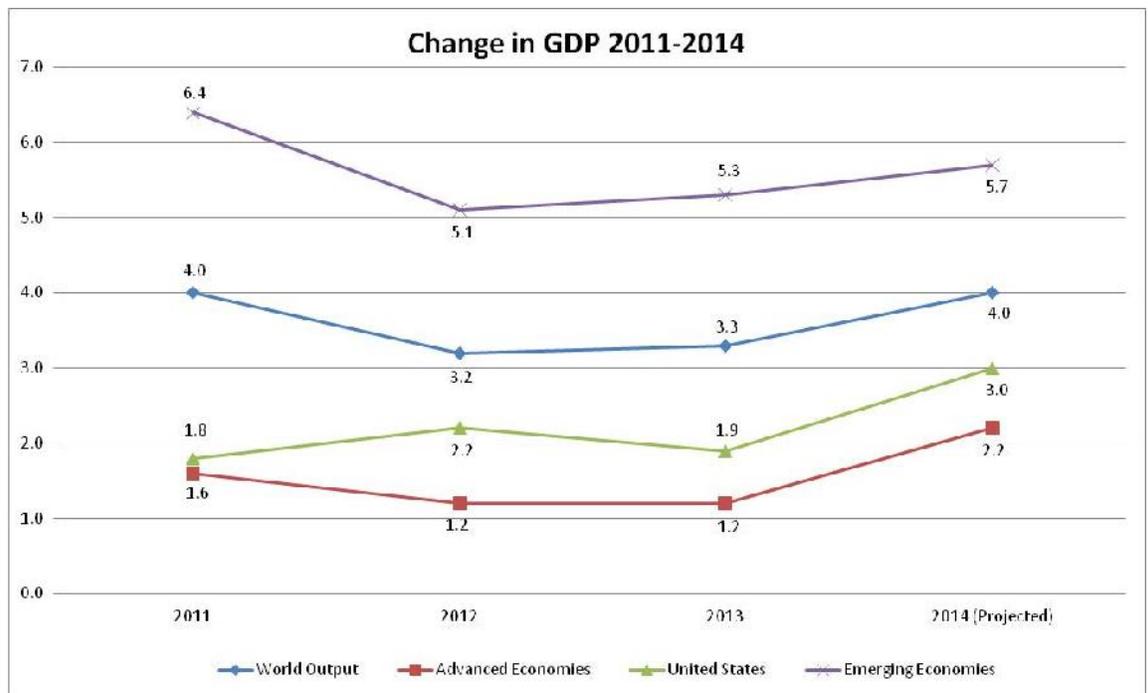
## II. Market Report

### A. National and International Factors Influencing Construction Costs

#### Economic Factors

Both the international and national economies have continued their slow and steady recovery. The world economy is expected to grow at a rate of 3.3% in 2013, moving up to 4% in 2014. Nationally, the 2nd quarter GDP estimates are 1.9%, with 3% growth predicted for 2014. This marks 9 consecutive quarters the economy has posted positive gains. The construction industry outlook, as captured by ENR’s Construction Industry Confidence Index, leapt up to 69, and the survey showed increasing confidence in 14 of 15 markets.

However, the recent 40% increase in mortgage interest rates from May to June resulted in a surprising 13% drop in new home sales in July, sparking concern that rising interest rates could put the brakes on the recovering economy.

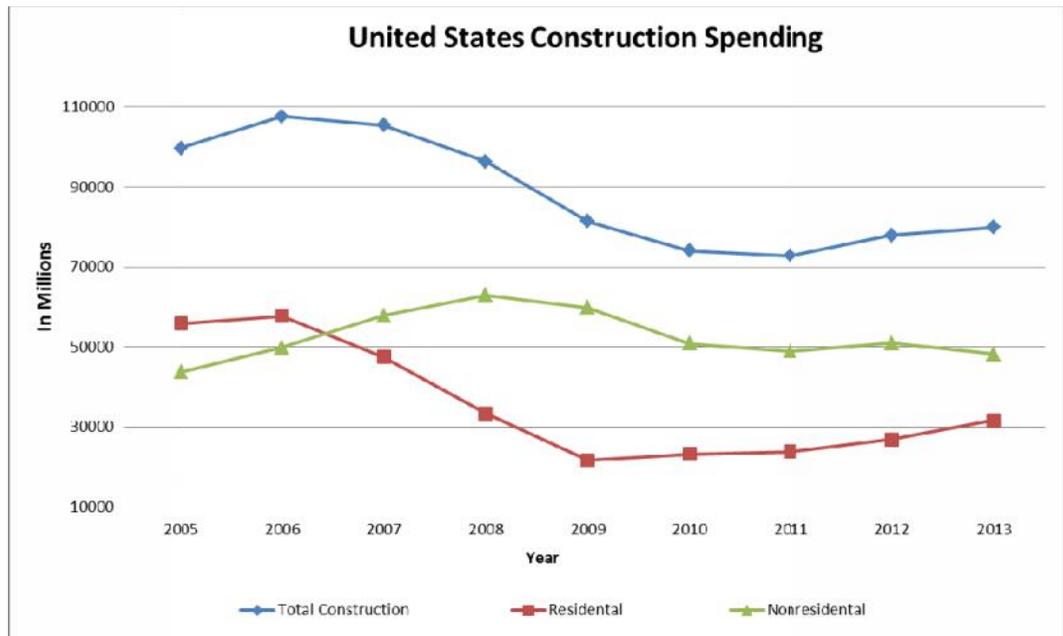


#### Materials

Global demand for oil, steel and other commodities has decreased in 2013 and are forecasted to decrease again in 2014, balancing large increases in residential construction materials such as lumber and gypsum wallboard, resulting in moderate materials increases of 2.5% projected for 2013.

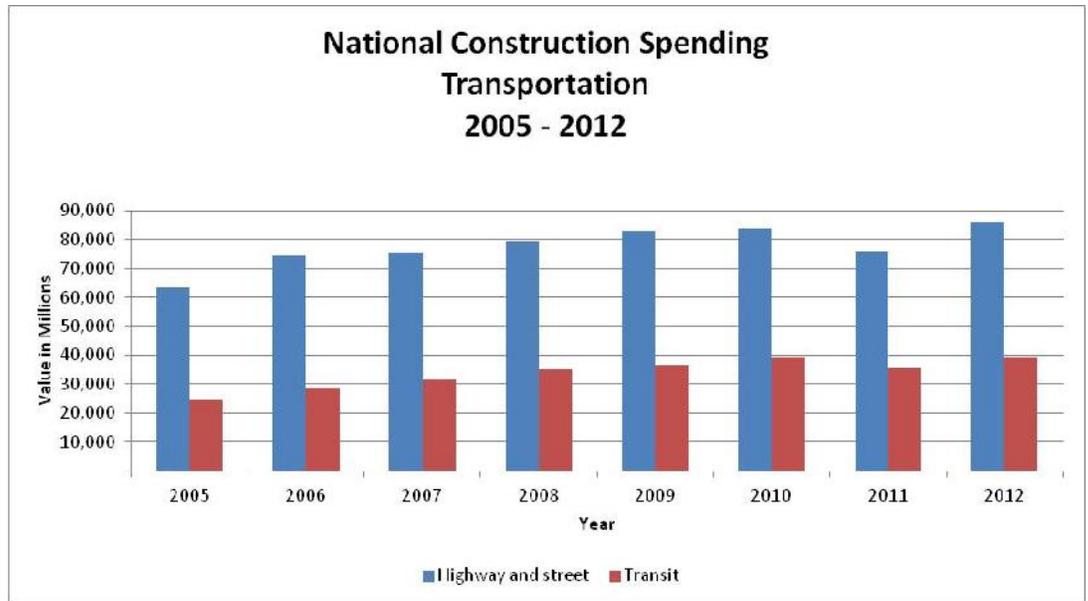
### National Construction Spending

The following graphic shows the difficulty in the current market for construction. The graph shows the decline in market from a peak of \$1.2 trillion to a low ebb of \$764 billion in 2011, and rebounding to a current projection of \$789 billion, a drop of 25% in construction spending from the high. However, the Bureau of Economic Analysis captures spending, not starts, so construction spending should increase at a higher pace in 2014.



In short, while demand in the national construction market is improving, there is still a long way to go, and the national construction economy will continue to have significant room for growth for the foreseeable future.

In the two sectors most likely to affect the LACMTA market, a 14.7% increase in transit spending is countered by a 3.8% decrease in street and highway spending, leaving the total transportation market flat relative to a year ago. .



While the market should remain relatively stable through 2013 with moderate price gains, there is some risk that prices may rebound dramatically should the economy experience a robust recovery in 2014 and 2015. Contractors and subcontractors have held down margins ruthlessly to win work, but should the economy recover, there will be no such incentive. In addition, in one of the deepest and longest recessions since the depression, the construction industry has lost over 2 million jobs. To train a journeyman skilled worker takes 4 years. Should a robust recovery occur in 2014-2015, there may be labor shortages in select trades or specific geographic area leading to price spikes far in excess of actual labor and material increases. This is what happened in 2004 when put in place prices (v. labor & material) rose 10%. Should the recovery be more gradual, similar price spikes may be avoided.

**i. Amount of Current and Projected Construction Activity in the Southern California Region**

According to data collected from Dodge Reports, which is the only source for comprehensive construction activity by region, construction starts in the Los Angeles area increased 13% in 2012 and is only projected to increase by 1% in 2013.

However, according to Dodge, construction spending has been led almost exclusively in the buildings sector. The Los Angeles region experienced an increase in residential starts of 37% and 22%, respectively, in 2012 and 2013. For buildings overall, there has been an increase of 15% in 2012 and a decrease of 8% in 2013.

In the non-buildings category, which would affect the LACMTA market, Dodge reports that after a 40% increase in growth in 2011, construction starts experienced a 4% and 12%

decrease in 2012 and 2013; however, noting the greatly increased spending by LACMTA in 2012 and 2013, it appears Dodge may not have accurately counted infrastructure spending or that infrastructure construction currently impacting the market actually started in 2011. Both categories are expected to increase by 57% and 46%, respectively, in 2014. (Note: Dodge data only collects starts, so any Design/Build (DB) projects bid in 2013 will not break ground in 2013, so LACMTA's large DB projects bid this year will not be counted as a 2013 start).

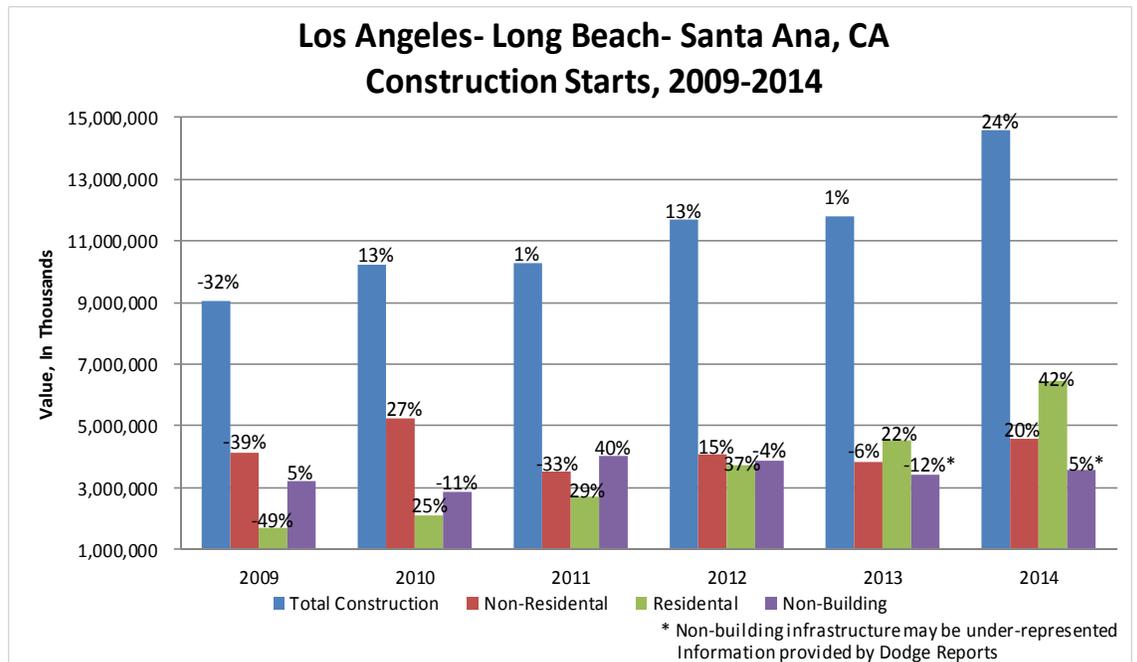
Dodge's methodology for calculating starts combines actual project data with benchmarking data derived from local, regional and national markets. As such, there is a good deal of variability in their calculations v. actual construction spending, and data collected indicates that Dodge reports may be inaccurate, at least in the infrastructure sector. A review of current capital spending plans/budgets of a variety of transit and infrastructure agencies throughout the region indicates that contrary to Dodge's data, infrastructure spending most likely has not decreased, and may have increased, led by LACMTA with the largest increases in construction spending.

### **LACMTA Creating Its Own Market**

A review of LACMTA's current 2013 budget shows LACMTA's annual capital expenditures nearly doubled from 2011 to 2013, going from \$948 million in 2011 to \$1.733 billion in 2013, an increase of 82%. Reviews of future anticipated capital expenditures reveal a staggering \$13.925 billion in planned capital expenditures from current to 2019. This is a result of LACMTA's "30/10 plan", in which LACMTA plans to spend 30 years worth of Measure R revenue in 10 years. On an average basis, this would result in approximately \$2.7 billion per year in capital spending. IMPLAN, a computer modeling system commonly used formula for calculating direct jobs (project planners, engineers and construction workers) on transit projects, uses a formula of 8,340 jobs per billion in rail transit construction. As this figure includes designers, planners and construction managers, we will assume that approximately 3,340 jobs (roughly) will be soft direct jobs and 5,000 (roughly) will be construction workers. Going by IMPLAN calculations, the LACMTA program alone (assuming the average of \$2.7 billion per year) would require 13,500 construction workers per year to staff the current LACMTA plan. Currently, Dodge shows the entire Los Angeles market for "non-buildings" construction at \$3.4 billion a year in starts; while this number may not accurately capture all the non-building starts, it appears the LACMTA program 2014-2017 would be equivalent to at least half, and possibly more, of the entire infrastructure spending in the region.

There is a strong possibility, much like the Los Angeles Unified School District (LAUSD) building program in 2004-2006, that the size of the LACMTA program could "create its own market" and the sheer size of LACMTA's program can overwhelm the local resources of the construction industry due to the rapid increase in LACMTA activity. While contractors interviewed did not cite this as a problem currently, the amount of design/build work being let this year (assuming a construction start date of 2014-2015) indicates this could become a more urgent problem in the 2014-2016 window and beyond. The majority of the

“30/10 work” should be accomplished by 2019, so there will be lessening on capacity constraints thereafter.



Looking into the future, Dodge predicts after a 1% overall increase in 2013, total construction starts are expected to jump 24% in 2014, lead by a 20% increase in non-residential starts and a 42% increase in residential starts; however, recent interest rate hikes may have cooled the housing market somewhat, and the 24% growth predicted seems somewhat ambitious. Much will depend on how the market responds to the recent rise in interest rates and drop in new home sales. If interest rates remain at the new levels, potentially some of the new housing projects currently planned may be put on hold.

Dodge shows a 12% drop in non-buildings starts in 2013 and a 5% increase in 2014. However, Saylor performed its own analysis of capital spending plans of many of the large infrastructure owners in Southern California, which show a **40% increase** in capital spending in 2012.

**Capital Expenditures by Agency  
Southern California**

	2011-2012	2012-2013	2013-2014
City of LA	\$150,180,271	\$184,742,201	\$201,245,922
County of Los Angeles	\$216,507,000	\$242,001,000	\$207,518,000
LA County MTA	\$1,138,750,000	\$1,496,792,000	\$1,515,351,000
LAX- Los Angeles World Airports	\$975,073,000	\$1,321,937,000	\$1,403,674,000
Orange County Transportation Authority	\$226,500,000	\$189,115,424	\$278,500,000

Port of Long Beach (City of Long Beach Harbor Dept)	\$401,907,973	\$629,954,700	\$720,405,061
Port of Los Angeles (City of LA Harbor Dept)	\$229,700,000	\$285,700,000	\$399,900,000
San Bernardino (SANBAG)	\$208,913,570	\$584,463,363	\$485,864,582
<b>TOTAL:</b>	<b>\$3,547,531,814</b>	<b>\$4,934,705,688</b>	<b>\$5,212,458,565</b>

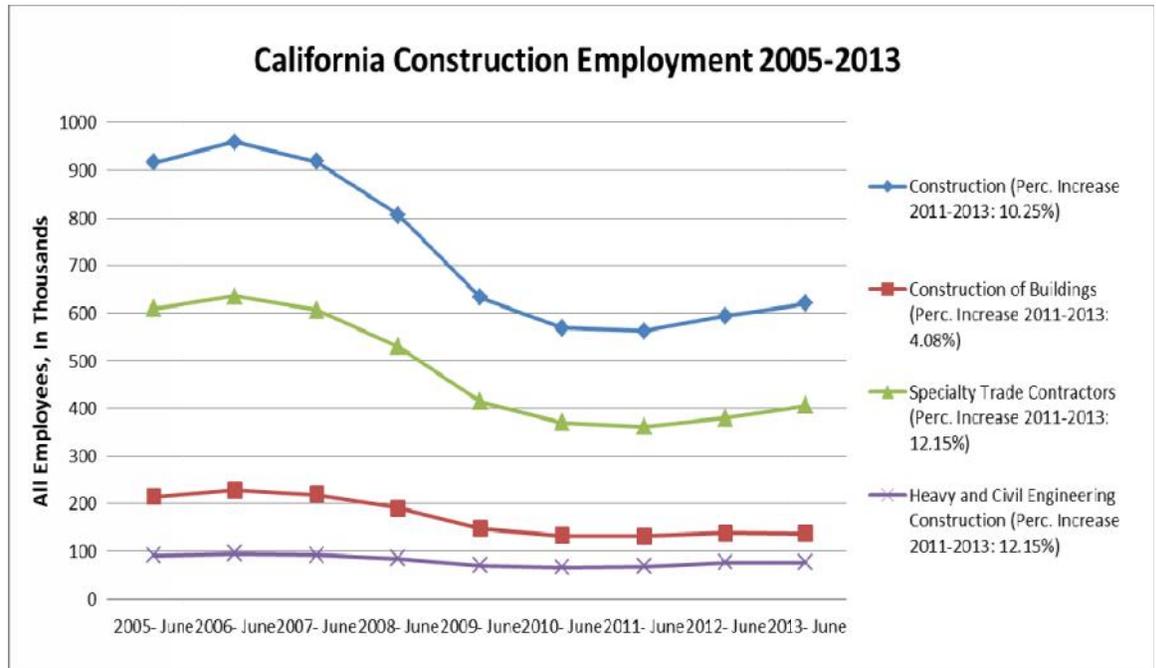
In addition to the increase in infrastructure spending, some of the labor categories, such as laborers and carpenters, will be impacted by the pace of the overall construction recovery, putting additional pressure on the labor market in infrastructure during the 2014-2015 window. In addition, the recovering real estate market may result in higher property tax revenues for municipalities, allowing increased municipal construction spending in the 2015-2019 window. The recovering economy may also improve the state's financial condition, allowing more state construction spending.

Overall, the economic indicators point to a recovering economy, which generally results in increased capital spending. Therefore, although definitive starts information is not available past 2013, we would expect the market to continue to trend upward. The lower prices seen in the 2009-2012 window were primarily the result of a hyper competitive marketplace coupled with a very productive construction labor force. Year end 2012 prices on the Caltrans' Construction Price index show prices that are barely above 2004 levels, and 20% **below** the high of 2006-2007. Therefore, it is anticipated as the market becomes more balanced in the 2013-2014 window, and more constrained in the 2015-2019 window, prices may rise in excess of labor and material increases, as new, less productive laborers enter the market and contractors and subcontractors allow their margins to rise to normal (pre-recession) levels.

**ii. Analysis of macroeconomic employment trends**

The California labor market has significantly improved since 2011. As of June 2012, California stood at 11.9% unemployment; currently it rests at 8.4%. Most encouragingly, the sector showing the highest gains in employment were the long term unemployed, a category that showed a 22% decrease in unemployment 2012-2013. The Los Angeles area is showing more modest signs of recovery, with the Los Angeles-Long Beach-Santa Ana Metropolitan Area unemployment declining from 11.7% % in June 2011 to 9.2% in June 2013.

Construction employment has been the leader in job gains in California for at least two quarters, increasing by 10.3% overall over the past two years. We are particularly examining the past two years, as these are the years that would have impacted LACMTA's bids in 2012. In the sectors most likely to affect LACMTA construction, heavy and civil construction increased 12% and utility system construction increased 13.2%.



While the employment situation is improving, construction employment levels are still 35% below 2006 levels, so there is still significant capacity in the California construction labor market. In the heavy and civil category, however, employment is much more stable, and current employment levels are only 20% below the peak in 2007.

#### Los Angeles Area Market

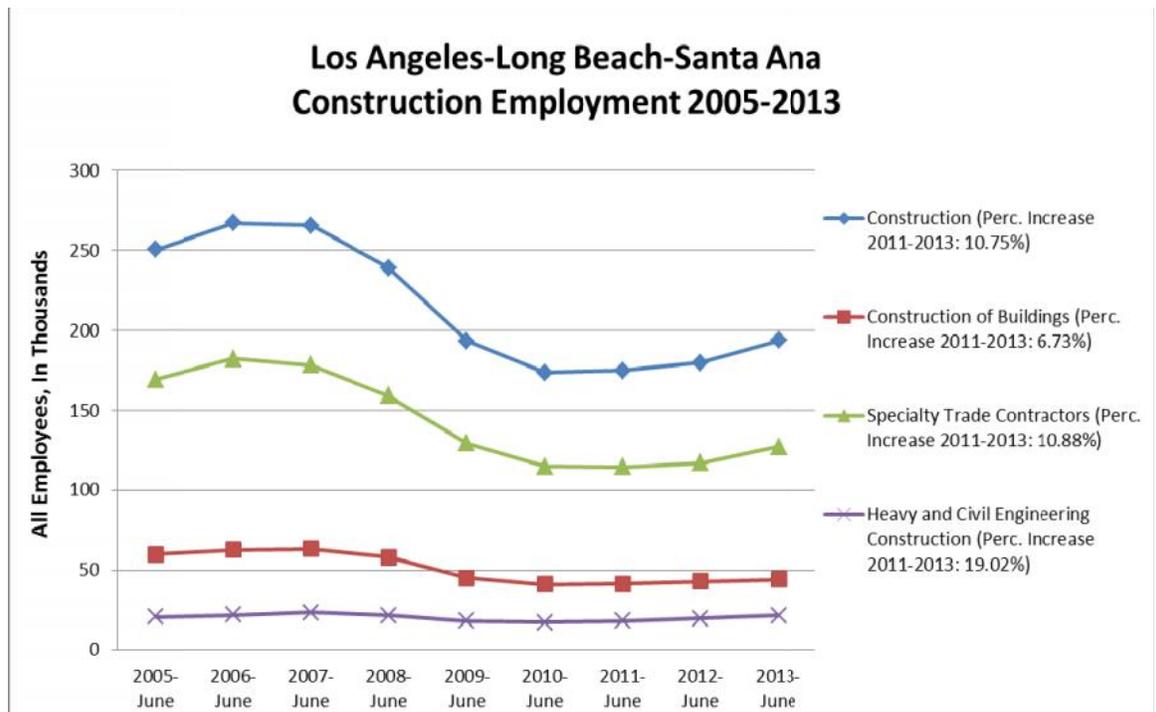
In terms of the local area employment trends, the Los Angeles-Long Beach-Santa Ana area shows signs of improvement. Overall construction employment for the area echoed state employment with a 10.7% increase in the 2011-2013 timeframe, with building construction employment increasing 6.7% during the same period. Specialty trade contractors also increased 10.8%.

Heavy civil construction employment, the category most likely to affect the LACMTA pool, showed a strong increase from 2011-2013 of 19%. This is likely in part due to the effect of the significant increase in LACMTA spending. Going again by the IMPLAN formula, LACMTA’s increases from \$948 million in capital spending in 2011 to \$1.733 billion in 2013 (assuming all other infrastructure remained stable) would have added approximately 2,475 construction workers in 2012 and an additional 1,450 jobs in 2013. The amount of jobs added in the heavy civil category is likely the result of the increasing LACMTA program.

With residential starts increasing from \$1.7 billion in 2009 to \$4.5 billion in 2013, this represents an increase of 165% in activity over the past four years. While residential hiring has lagged starts, we expect employment to increase significantly in 2013 assuming the starts data is accurate. In addition, multi unit residential starts have tripled since 2009, and high rise multi-family projects compete with other commercial and non-residential projects for labor, raising the changes of shortage of union labor.

In the 2014 window, total starts in the region (all sectors) are projected to grow by an additional 24%. While there is still excess capacity in the market, this spare capacity could evaporate quickly should Dodge’s construction starts prediction be accurate for 2014. Currently, Bureau of Labor Statistics (BLS) show a construction labor force in the Los Angeles area of 194,000 construction workers. At the high in 2006, the workforce was 267,000; a difference of 27%. If Dodge’s predictions are true, a projected 24% increase in total construction starts could quickly begin to absorb unused labor capacity.

Another factor to consider is heavy civil employment has never varied as steeply as general construction employment. Spending in infrastructure is generally steady, and does not generally exhibit the large swings the private market does, so there is less unused capacity in this sector. Additionally, the steep hiring gains in this category over the past two years (likely due to the LACMTA program) leaves Los Angeles heavy construction employment only 7.5% under the peak of 2007. Therefore, adding additional workers quickly in this category may be more difficult. A large proportion of workers, such as laborers, can easily transfer to the infrastructure market; adding more skilled categories such as operating engineers may prove difficult as the LACMTA program expands 2014-2017. Constraints in labor capacity may occur in this later window.



## B. Interviews with Relevant Contractors to Determine Key Factors Influencing Cost

Leland Saylor Associates conducted telephone interviews with eight infrastructure contractors with experience bidding and working on LACMTA projects. The interview pool was selected by LACMTA and included major generals, some smaller/midsized firms, and one sub. Interviewees were assured all comments would be anonymous and they could speak freely about topics influencing construction cost. The subjects generally were forthcoming and were appreciative of LACMTA's efforts to interface with the contracting community.

Topics included:

- Recent labor and material costs and availability
- Profit and overhead trends
- Bidding trends
- Escalation forecasts
- Metro specific contractual conditions
- Project delivery methods
- Perceived risk, both industry specific and Metro specific
- Contracting and hiring goals
- Labor relations practices
- Recommendations to reduce cost/risk

It was clear all contractors perceived the market a little differently from one another, and all contractors perceived risk as one of the biggest factors influencing construction cost. In general, none of the contractors had seen any labor and material trends that would account for a 15 to 20% in bid pricing beginning in mid 2012, and most indicated their costs and sub bids were only escalating at the typical 2.5% to 3% indicated by ENR, AGC and other nationally published sources.

While there was a wide variation of answers on many questions, the general consensus was the greatest risk on LACMTA contracts is the possibility of delay and cost due to unforeseen conditions and utility relocations.

Another risk commonly perceived was the uncertainty of compensation for changes and the length of time processing changes. Together, unforeseen conditions and compensation and delay of changes pose the largest perception of risk in the Metro contracting pool. We understand LACMTA is addressing the utility relocation risk by having advance utility relocation packages, and this should mitigate this risk substantially. All contractors agreed lowering risk would result in lower bid prices.

Topics addressed in the interview include the following:

### **Perception of Market/Number of bidders**

Perception of the market was highly individual, with about half the contractors saying it was busier, a quarter feeling it was the same, and a quarter feeling it was slower. The perceptions of number of bidders was similarly inconsistent, with some feeling there was more competition in DB and less in Design/Bid/Build (DBB).

### **Backlog**

Another good indicator of the state of the market is contractor backlog. The answers to this question were similarly inconsistent, with approximately half saying it was larger and half saying it was smaller.

### **Availability of competent subs**

All contractors indicated there were no shortages in any trades; however, the general consensus was finding qualified DBE subs that could bond multiple contracts over \$250,000 to \$500,000 was a struggle.

### **Labor and material trends**

As all contractors we spoke with were Union, all labor wages (except for managerial labor) are covered by Union agreements and wages under those agreements, for the most part, are escalating in the 2.5% to 3% range. Similarly, most contractors perceived materials escalation to be fairly modest, in line with ENR and ACG indexes. No contractors perceived any shortages in any materials, or any large price spikes in any individual material.

Most contractors were carrying 2.5% to 3% escalation for 2013. Some carried this number through to 2017; some were carrying higher rates of escalation (3.5% to 5%) in the later 2015-2017 window.

### **Bonding**

All contractors indicated in general, bonding was not an issue for them; a few mentioned it may be an issue at the sub level, but except for DBE's, they did not see this as a significant problem. The exception was bonding for "unlimited liability"; even very large, global contractors had some difficulty securing bonds for "unlimited liability".

### **Delivery methods**

All contractors indicated they performed projects under both delivery methods, (DB and DBB) with half performing more DBB work and half performing more DB work. All indicated they preferred the design/build delivery method. They acknowledged design/build incurred more risk, but felt their organizations performed well and adequately managed the risk associated with this delivery method. With adequate risk management, they felt design/build offered more financial reward for innovation and more opportunity to control outcomes. Contractors also felt design/build offered the added benefit of a more leveled field of competition, as they felt there were fewer firms who can offer design/build on more complex projects.

## Metro Specific Contractual Conditions, Processes and Procedures

In general, most contractors felt LACMTA was one of the more risk averse Owners in the Southern California area, citing bonding requirements for unlimited liability and higher insurance limits than typical. Also, there is a perception that LACMTA assigns more of the risk for unforeseen conditions to the contractor and perceived the contractor must accommodate that risk within their bid. However, some acknowledged the threshold for entitlement to compensation for unforeseen conditions could vary depending on the LACMTA project manager. Some contractors mentioned LACMTA is trying to address unforeseen condition risk by preparing advance utility relocation packages, which would substantially reduce risk for the contractor.

It was also perceived LACMTA in general had more administrative requirements, and was more restrictive in terms of DBE goals, hiring and PLA requirements than other transit agencies. This is typical of an urban transit owner like San Francisco Municipal Transportation Agency (SFMTA) versus more suburban agencies such as Orange County Transportation Authority (OCTA), SANBAG and SANDAG.

The following LACMTA specific contractual conditions, processes and procedures were discussed with the contractor pool:

Prequalification procedures: Most contractors thought this process was fair and transparent, although cumbersome. A few felt it was not restrictive enough, while a few thought it was too restrictive. A few mentioned the requirements for specific personnel on the design side to have worked with specific personnel on the contractor side is too restrictive, and did not always deliver the best personnel for the project. One commented this issue had been addressed, and LACMTA allows multiple resumes within a design/build team to address shared experience. A few would prefer LACMTA only look at experience in transit design/build, and eliminate the requirement that the two firms have worked together before, as they felt this inhibited the best potential teaming.

Proposal Documents provided for bid: Most thought the proposal documents provided good documentation. A few commented there were often inconsistencies between scope of work and specifications; or within specifications. While the contractors acknowledged this was a fairly common occurrence in large transit projects, they would like more guidance in interpreting inconsistencies during the proposal phase. Currently, they indicated they will often pose questions about the specs, with the answer being “refer to the specifications”. Without definitive direction regarding inconsistencies, contractors will assume the most stringent interpretation, which may add to cost. One contractor indicated he would like more “reliance” documents; most documents provided were “at the contractor’s risk”.

Time allotted for bid preparation: Almost all indicated the initial time allotted for bid is too short, but it is generally extended in two week or month increments. They proposed a longer initial bid time, with no extensions, would be preferable. One said the time allotted is too long...”Time is money”.

Specifications: A few mentioned the specifications were too voluminous, with specifications referring to the same items with differing requirements, causing inconsistencies. They acknowledged this is fairly common among transit agencies, however. Several mentioned LACMTA's specifications are very high end. None noted any significant problems.

Bonding and insurance requirements: Most contractor's felt LACMTA's bonding and insurance requirements were high for the \$600 million + contracts, and several indicated even securing a bond for unlimited liability was difficult, and almost impacted their ability to bid the project. One contractor mentioned "it used to be 15% of total contract."

Some indicated some DBE's had difficulty bonding, and it would be helpful if LACMTA would provide some sort of bonding program for DBE subs to help increase utilization.

Risk allocation: Most felt LACMTA's risk allocation assigned more risk to the contractor than was industry standard, while a few felt it was standard. Some indicated risk allocation was sometimes influenced by the project manager, with some project managers providing more assistance in both avoiding delays (by gaining compliance and approvals from Caltrans, City, and County of Los Angeles) and by allowing compensation for delays and unforeseen conditions should they occur. One contractor indicated some agencies' policies were "We'll give you a clean corridor and any problems you find, we'll take care of it" versus his interpretation of LACMTA's contract: "Carry your contingency in your bid".

DBE Policies: Most indicated all federally funded work required DBE participation, but that LACMTA's is higher than most of the suburban agencies as the pool of available DBE subs are larger. LACMTA's current DBE goal is similar to Caltrans. Most indicated there is no difficulty in finding subs that can bond and bid \$500,000 subcontracts, but it becomes exponentially more difficult to find those who can bid \$5 million to \$10 million subcontracts. A few mentioned they had to provide bonding to some DBE subcontractors to reach the DBE goal.

The current race neutral goal of 14.2% is not considered difficult to fulfill on smaller projects but becomes difficult on the \$600 million + mega project scale. Comments on the difficulty of finding DBE subs for larger projects are as follows:

- "Have to split into much smaller packages, so risk and management goes up"
- "Many DBE's will refuse to take bigger projects because it will graduate them out of the program"
- "Always a struggle but we are meeting the goal"

However, LACMTA's current DBE goal is not a hard goal, and most contractors did not feel it significantly increased cost.

Contractors were more concerned about their ability to fulfill the goals on mega projects once the 27% race conscious goal is introduced in October 2013. They were concerned a race conscious goal will eliminate some competition between DBE's, given the current difficulty garnering larger DBE bids, and will substantially limit participation by non MBE

WBE's who currently satisfy the current race neutral goal. Additionally, there was considerable confusion about how the new policy will be implemented. Several indicated there was conflicting information about whether the new goal will be mandatory or will accept Good Faith Effort, and how it will be implemented.

Progress Payments: All contractors felt there were no problems with LACMTA's progress payment procedures.

Change orders: Most contractors felt there were significant delays with change order processing. The perception was change orders are negotiated at the Construction Management (CM) level, but the delays occurred when the negotiated changes were forwarded to the internal LACMTA review division. There was also the perception LACMTA did not have enough staff in the change order review section, impacting timely processing. Some noted changes over \$1 million have to go to the board for approval, which further delays processing. Some indicated for some large changes, LACMTA may issue an NTP with an initial amount smaller than the contractor's proposal, and then difficult to negotiate the entire change after the fact. Contractors indicated after the CM negotiation, internal review and board review procedures delay processing by six to seven months, and sometimes can continue up to 18 months. Some mentioned delay is especially difficult for DBE subs, and one said he must pay his subs prior to being paid himself to avoid potential of sub failure. It is unknown if this is a common practice, but if so, this could add to contractor risk.

Some also indicated delays in change order processing is common at other agencies, with OCTA specifically being an exception.

Green/Sustainability policies: Most thought green/sustainability related primarily to buildings, and were not aware of any particular sustainability policy of LACMTA's. Requirements for newer, cleaner equipment are considered industry standard and were not considered to be a significant impact to cost.

Suggestions for reducing cost to LACMTA: Aside from labor and material, the majority of the contractors perceived risk as the biggest determinant of cost (assuming a balanced, competitive market) and addressing and mitigating risk could have the largest effect on cost reduction. The biggest risk was perceived as costs and delays associated with unforeseen conditions, which are currently exacerbated by the complex relationships between LACMTA, Caltrans, and various departments within the City and County of Los Angeles. Some contractors cited specific projects where these problems occurred. Some contractors indicated more robust cooperative agreements between these agencies would substantially reduce this risk, and with it, cost.

Some commented LACMTA is addressing some of this risk by providing advance utility relocation packages on current solicitations, and felt this would have a substantial effect on risk reduction, and therefore, cost reduction.

Partnering was also a common topic, citing "embracing partnering on all levels" as a potential factor in reducing cost. Currently, several contractors mentioned partnership was

often project manager dependent, and common LACMTA contractual conditions are addressed differently, depending on the project manager.

Project managers were also seen as a large determinant of delay risk, as the ability of a project manager to push through reviews, garner approvals, and manage the relationships between LACMTA, Caltrans and the City and County of Los Angeles has a significant effect on the overall success of the project. Contractors feel they have little control over the agency approvals process and other third party delays, and a good PM's help is essential in achieving project success. The East Side Metro Gold Line Extension project was cited as a successful project in this regard.

Improving the change order process was another fairly common suggestion to reduce cost: lack of clarity about what LACMTA will cover can increase risk. Carrying cost related to delays in charge order processing time adds to cost.

Other suggestions included:

- Less restrictive PLA
- Escalation clauses for select materials
- Fairer division of risk and responsibility
- Confidentiality on ATC's
- More communication and clarification during proposal phase
- Reduce insurance, bonding and liquidated damages to perceived industry standard
- Split packages into smaller components reduces escalation and bonding risk (currently, large programs have to carry bonding and escalation six to nine years out. Many agencies split packages into:
  - Utilities
  - Tunneling
  - Systems
- Smaller packages also facilitate DBE participation
- Split bonding for design & construction into two separate bonds

### C. Interviews with Southern California Infrastructure Agencies

Four agencies were interviewed; Caltrans District 7, SANDAG, SANBAG, and Port of Long Beach. The agencies were surveyed about general perception of the market, project delivery methods, bidding trends, DBE goals, PLAs, allowances for escalation and specific agency contractual conditions.

*General perception of the market:* Agencies felt the market was busier, and that most of them were letting more work.

*Number of bidders:* Most perceived they were getting about the same amount of bidders per project.

*Project delivery method:* The majority of projects let use DBB; most had only one design/build project. SANDAG will be utilizing CM/General Contractor (GC) method on their upcoming \$2 billion trolley project bidding this month.

*Variance with engineer's estimates:* Most owners felt the majority of their projects were still bidding under engineer's estimates, a perception borne out by Saylor's independent review of bids.

*Unforeseen conditions risk:* The Owners by and large felt their agencies assumed the risk for unforeseen conditions. SANDAG in particular seemed very focused on this risk and would not award projects until easements and right of way issues were resolved. In the event these issues could not be resolved prior to construction, a risk contingency was built into the project budget.

*Risk assessment:* SANDAG in particular has a very robust risk assessment program, with separate risk matrices for each type of project.

*Escalation:* Most agencies were carrying 2.5-3% escalation in their budgets; SANDAG was carrying 1% for 2014, 2% for 2015, and 2.8% for 2016.

*PLA/Local/Disadvantaged hire:* None of the agencies said they had a project labor agreement, local or disadvantaged hire program.

*DBE goals:* Caltrans had a 14.2% DBE goal for federally funded work; the remainder of the agencies had a smaller pool of available DBE's; therefore, their DBE goals were under 10%.

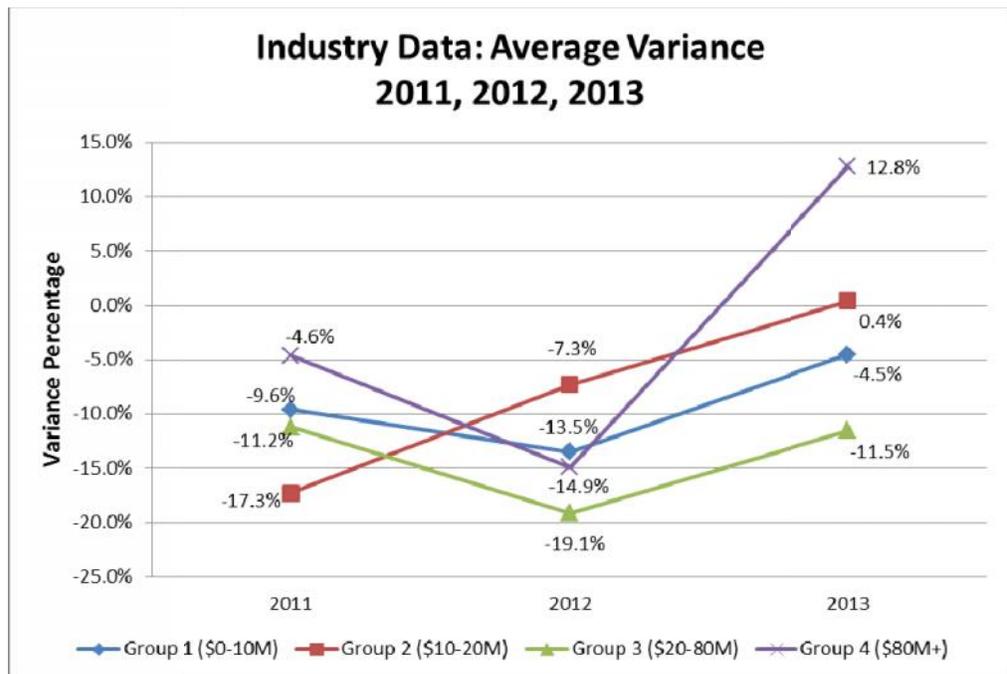
*Conclusion:* In general, agencies were not experiencing the same bid vs. estimate variances that LACMTA has seen; however, none of the agencies has increased capital spending as much as LACMTA has in the past two years. In addition, it appears other agencies may take more responsibility for unforeseen conditions risk than LACMTA, but this conclusion is based solely on contractor and agency interviews. Verifying this conclusion would require an audit of unforeseen conditions risks in the LACMTA program compared with other agencies' programs.

#### **D. Analysis of Current Trends in Bid Prices versus Engineers Estimates and Number of Bidders in the Region**

Leland Saylor Associates conducted an analysis of bidding trends in infrastructure projects throughout California compared to bid data collected from LACMTA. For non-LACMTA data, the project data was derived from multiple sources; online bid data sources, agency websites, news agencies and owner provided information. The sample included roadways, bridges, overpasses, tunnels, and rail transit projects; the project types most similar to LACMTA's projects. 48 bids were collected from 2011; 33 bids were collected from 2012; and 30 bids were collected from 2013, for a total of 111 non-LACMTA bids. For LACMTA data, 2011 information was not available; for 2012 and 2013, all bids under \$3 million were compiled and recorded for bid vs. estimate comparison, but were not compared against other agency bids. Considering only bids of \$3 million and up, there were only 11

projects in the LACMTA sample to compare to other agencies. Given the small size of the LACMTA sample, even one bid can skew the “bid vs. variance” comparison; therefore, the comparison must be taken in context.

To account for different markets for differently sized projects, the bid data was further separated into project size, as the number of bidders and percent of variance can reasonably be expected to vary by the size of the projects. The size categories selected were: \$3 to 10 million, \$10 to \$20 million, \$20 to \$80 million, and \$80 million +. Metro bids under \$3 million were compiled and recorded for bid vs. estimate variance, but were not compared against other agency bids. To avoid skewing the results, all bids over +/- 50% variance were eliminated from the analysis.

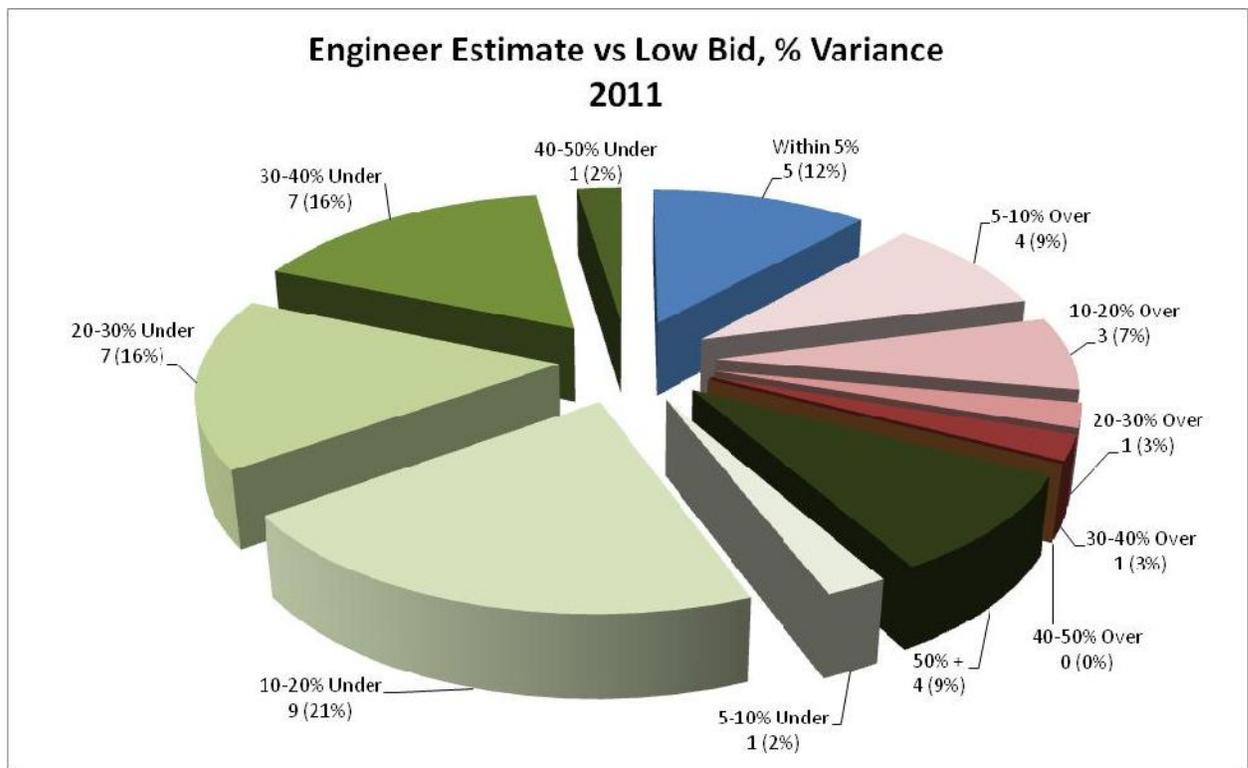


Overall, the bidding trends in the region indicate bids in 2011 were approximately 12% under engineers estimates; 2012 were 13.5% under engineer’s estimates, and 2013 indicates that bids are averaging approximately 3% under the estimate. By contrast, bids over \$3 million averaged 6% over estimate in 2012 and 33% over estimate in 2013. However, excluding LACMTA’s below \$3 million projects left only two projects in 2013, too small to make an accurate sampling.

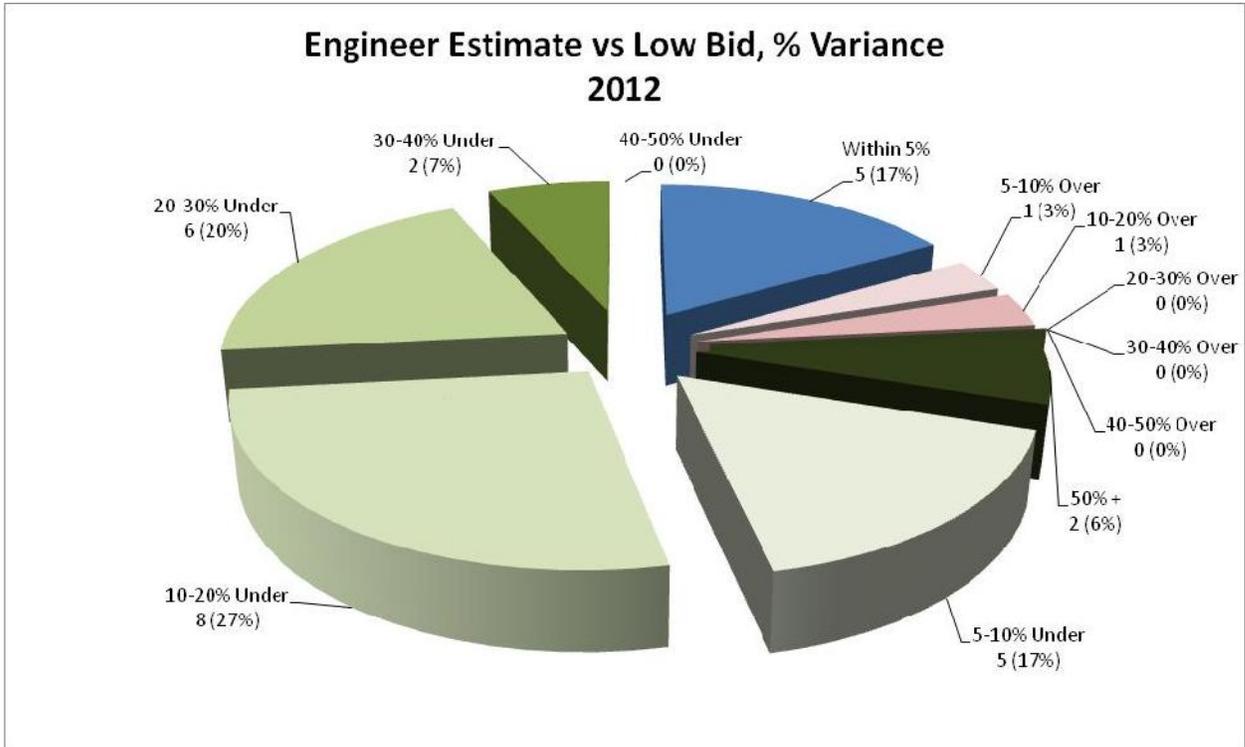
In terms of individual estimates and bid performance, 51% of the bids in 2011 came in under engineer’s estimates; 71% in 2012, and 41% in 2012.

The bid versus estimate comparison is only an imperfect assessment of the market. As estimators’ databases are not static, but are constantly updated to reflect market conditions, bids coming in under estimates in 2011-2012 and at estimate in 2013 are not an absolute indicator of trends in the actual cost of the work. It is, however, an indicator the market is becoming more balanced, and therefore, more predictable from an estimating point of view.

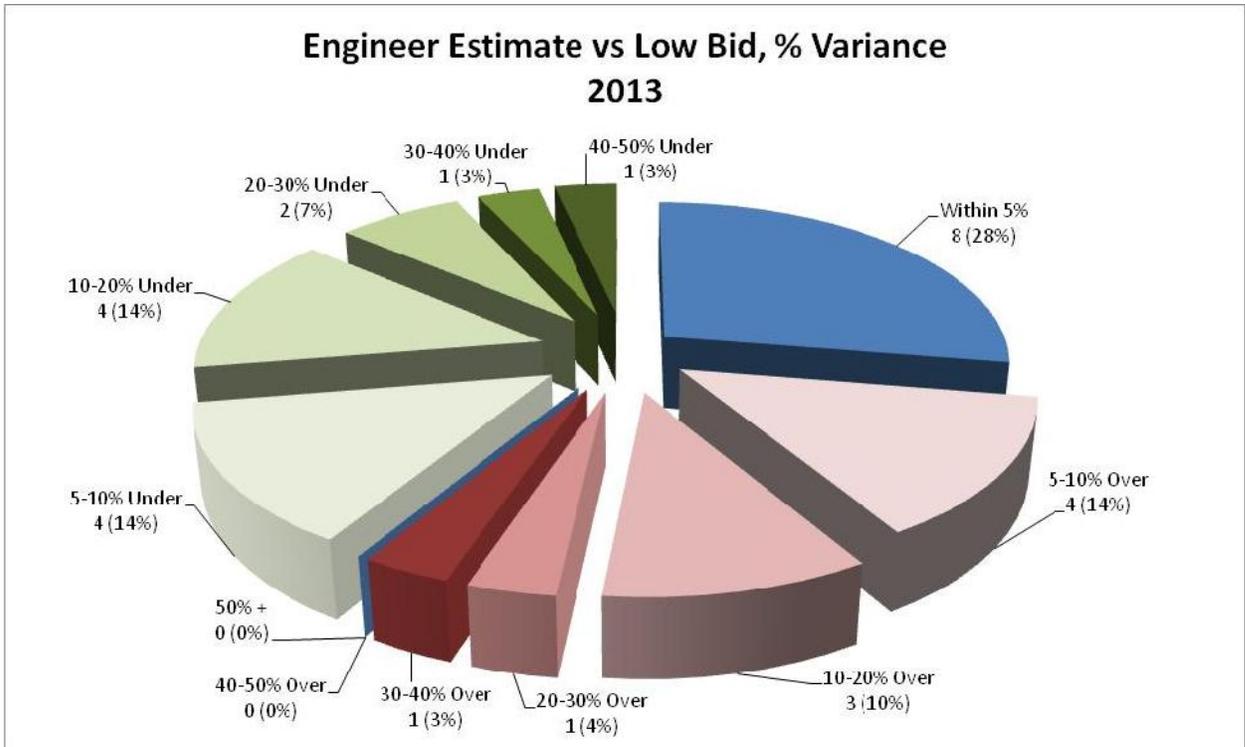
51% of the bids under estimate in general infrastructure sample, 2011



71% of the bids under estimate in general infrastructure sample, 2012



59% of the bids at or over estimate in general infrastructure sample, 2013. Greater proportion within 5% (evidence of a more balanced market)

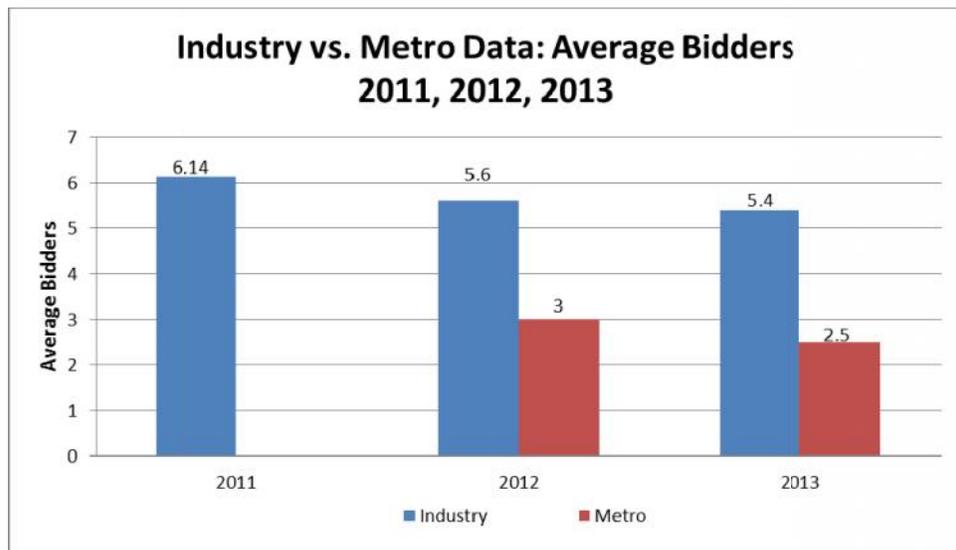


**Number of bidders as related to estimate variance**

A common predictor of estimate variance is the amount of bidders on a project. Leland Saylor Associates has been tracking bid versus estimate trends for over 50 years, and over time, a common pattern emerges that is loosely true:

Number of Bids	% Differential from engineers estimate
1 bid	+25% to 50%
2-3 bids	+10% to 25%
4-5 bids	0% to +10%
6-7 bids	0% to -10%
8-20 bids	-10% to -25%

As such, it might reasonably be expected the number of bidders on LACMTA projects may influence bid vs. estimate performance. Below shows the average number of bidders on industry projects vs. LACMTA projects (3 million +). On projects \$3 million +, LACMTA tends to have less bidders than industry average. A large proportion of this differential may be due to LACMTA preference for design/build on larger projects, and there are fewer firms which can perform design/build well, which limits the bidding pool.



(Metro bid data not available for 2011)

However, recent (late 2012/2013) DBB LACMTA projects under \$3 million received as many as 10 bids and still were significantly over budget, so the general trend (more bidders = lower cost) may not hold true within the Metro contractor pool.

In regards to trends in the actual cost of the work, a useful metric is actual cost per bid item. Caltrans has been keeping such data, on every bid item of work throughout California, since 1972. Caltrans compiles all data collected throughout the year, and updates its Caltrans Highway Price Index quarterly based on the thousands of line item bids collected. For 2012, while there were fluctuations throughout the year of +/- 8%, the

year end index had only changed .1% from the preceding year. Therefore, it appears the actual bid prices did not change significantly from 2011-2012. However, Caltrans does not build rail transit, so prices in this category could have risen more significantly.

Another interesting trend is the variance by size of project. Overall, bids tended to come in under estimate by a wider margin on the smaller projects, with bids on larger projects coming in under the estimate by a smaller margin.

In the “mega project” category (projects over \$600 million), there were only two samples in the 2012-2013 California region; Crenshaw/LAX Transit Corridor project and SF Muni 3<sup>rd</sup> Street Light Rail. Both projects exceeded engineer’s estimate by over 15%. Both mega projects were also within crowded urban environments, had more restrictive labor policies than suburban projects, and had higher DBE/Local Business Enterprise (LBE) goals than suburban projects. While the two projects are too small a sample to deduce trends with certainty, a possibility is that dense, urban projects with more restrictive labor/DBE/LBE policies have more risk, and therefore, exceed budgets more often.

In general, research over time has shown mega projects more consistently exceed their budgets than more typical construction projects.

## **E. Independent Assessment of Causes of Price Increases and Projection of Future Pricing**

### **Increasing activity in the region**

Evidence of increased infrastructure activity in the region is somewhat equivocal. Much like the rest of the country, construction activity is increasing throughout the Los Angeles area, lead by the residential sector. While Dodge reports shows a drop in infrastructure spending in 2012-2013, other evidence, such as heavy civil construction hiring, review of agency capital plans, and contractor interviews, indicate market activity is increasing. Throughout 2012, there were no significant indicators of this effect on the construction market; unit costs (as captured by Caltrans Highway index) and percent of bids under estimate at most agencies, remained virtually unchanged throughout 2012, coming in, on average, 13.5% below engineer’s estimates.

In 2013, however, the bid vs. estimate variance tightened considerably, with most bids coming much closer to the estimate. While this is not evidence of an overburdened market, it is convincing evidence of a more balanced market, ending the hypercompetitive 2009-2012 years.

It is important to note highway construction prices, as indicated by the 2012 Caltrans index, are at the same level they were at in 2004, while the ENR construction cost index, i.e., labor and material, is 34% higher. Since neither labor nor materials have stayed static, the lower unit costs (adjusted for inflation) are primarily due to the extremely productive workforce left in the construction marketplace. It is also indicative of the low profit margin that contractors and subcontractors lived with during the recession. Therefore, it is reasonable to assume as contractors add staff, there will be some

decreases in labor productivity as new workers are introduced to the market. Additionally, as contractors return to a more balanced market, it is likely prices will escalate above normal labor and material increases, as contractors and subcontractors return to pre-recession levels of profit.

In short, all the data available points to a recovering market, and we believe this has a contributory effect to the higher prices LACMTA is receiving.

#### **LACMTA making its own market**

A review of LACMTA's capital spending plan shows that capital spending increased from \$1.13 billion in 2011 to 1.51 Billion in 2013, an increase of 33%. While none of the contractors indicated increasing activity was a problem, it could be the pool of contractors most familiar with LACMTA's procedures and most likely to bid LACMTA work became less competitive as more and more work came on line in the 2011-2013 window. To accommodate LACMTA's 30/10 plan, it is estimated that the agency could increase capital spending to \$2.7 billion per year through 2019, putting pressure on the already bustling infrastructure market. LAUSD had a similar difficulty in 2004-2007; during a recovering market, the amount of LAUSD work overwhelmed the LAUSD contractor pool in the short term, causing bids to come in over estimates on the vast majority of LAUSD projects. While the current market is more competitive than the 2004-2007, it could be posited that, since infrastructure spending varies less than buildings spending, the infrastructure market is less equipped to accommodate rapid increases in spending. Therefore, the increase in LACMTA work could have a contributory effect on increases in bid pricing.

#### **LACMTA specific processes and procedures**

While the evidence suggests the economy is recovering, and in 2013, this is having some effect on bid prices throughout the industry, this effect is magnified within the LACMTA bidding pool. While the majority of bids at other agencies are coming in, on average, within +/- 5% in the 2013 window, bids received by LACMTA are generally exceeding budgets by a much higher margin, even smaller projects with 8-10 bidders. Therefore, it is probable contractual requirements, processes and procedures specific to LACMTA are intensifying the effect of a recovering market.

#### **More regulated environment**

Urban agencies tend to have a more regulated environment than suburban agencies, in regards to local hiring, disadvantaged hiring, higher DBE goals and other requirements all tend to add both cost and administrative burden to the contracting community. In a recession, evidence shows the contractors will work with within the regulatory environment; within a recovering market, anecdotal evidence suggests the increased regulatory environment can reduce competition and increase cost. Currently, Saylor is working with two agencies in the same city, building similar types of work. One agency has extensive contractual requirements, with a high local hire requirement, complex LBE requirements, and considerable administrative burdens; the other with few administrative

requirements. The highly regulated agency generally receives two to three bids, while the other regularly receives four to six bids, with correspondingly lower costs. Anecdotally as well, the few large transit programs are significantly exceeding estimates (LACMTA, SF Muni, and New York MTA East Side Access Program) are all in dense urban environments with extensive administrative requirements. Additionally, contractor surveys indicate the more regulated environment at LACMTA increases costs. Therefore, it is likely the more robust administrative requirements at LACMTA increase costs.

### **DBE Goals**

Currently, LACMTA's DBE goals are voluntary, race neutral and within industry parameters, and as such, add minimal (if any) cost to the work. As such, we do not feel the current DBE goals are a factor with LACMTA's increasing costs. However, the new DBE goal of 27% is race conscious, and believed to be a hard goal. While the smaller projects may achieve this goal with the addition of one or two DBE subcontractors, a \$1 billion project would require \$270 million in DBE participation, \$220 million race sensitive.

If there is a deficit of required DBE contractors which can bond and perform larger contracts, lack of competition in this area could push up costs quickly. As an example, LACMTA documents show the agency is planning on awarding \$5.3 billion worth of work in the 2013-2015 timeframe. Assuming a 20% DBE goal (assuming some projects are awarded before the new goal takes place) that would entail \$1 billion in DBE contracting. If there is a lack of DBEs capable of taking on that much work, then competition would decrease and costs would increase. If DBE bids are 10% higher than non-DBE bids, for instance, then this could increase costs \$27 million (on a \$1 billion project) or 2.7% overall; if DBE bids are 20% higher, then this could increase overall project costs 5.4%. The amount the new DBE goals can raise prices will be dependent on how the program is administered and how the good faith effort is interpreted.

To avoid potential cost impacts on larger projects, efforts should be made to determine the availability of certified DBE subcontractors capable of bidding \$5 million+ contracts. In addition, with almost \$5 billion of LACMTA work breaking ground in 2015, the shortage of DBE subcontractors able to take on additional work in 2015 may be a significant problem. If the DBE subcontractor pool is limited due to already contracted LACMTA work, then the larger contractors may only get one DBE bid for the larger scopes of work. Referring again to the Leland Saylor Associates "Number of bidders Vs. Percent of Variance" chart, generally, receiving only one bid may increase bid costs by 25% to 50% and receiving only two to three bids may result bids 10% to 25% higher. Therefore, as LACMTA contracts more of its work, hard goals should be examined for each project and matched with the available DBE pool that is ready, able and willing to bid LACMTA work (i.e., certified, has bonding capacity, and is willing to bid)

### **PLA**

LACMTA's PLA, with specific hiring goals, may impact costs, with increased administrative costs to ensure meeting the hiring goals, as well as the potential of higher costs due to lower productivity with less experienced workers. There is also the potential contractors

may have to hire more workers than required by the scope of the work to stay within the hiring guidelines. While the cost impact may be minimal on a larger project (1 to 2%), smaller contractors may have difficulties understanding and complying with the hiring goals, and this may impact the bidding pool and pricing on smaller projects. This effect may be magnified in the 2014-2017 window, as more LACMTA work comes online and fewer workers are available to meet the goals.

As the PLA is fairly new, it is difficult to make an accurate analysis to determine if the requirements of the PLA add cost, or if it will become more of an impact as the labor market becomes more constrained. Even if the PLA does increase costs due to lower productivity in the short term, the increased apprenticeship goals will likely aid the program in later years, as the earlier projects will train workers needed on the later projects. Additionally, the “no strike” guarantee eliminates some risks to the project.

### **Project delivery method**

LACMTA has a preference for design/build, whereas most agencies favor design/bid/build for their smaller projects. Most contractors indicated they preferred design/build, as it limits competition. They perceived design/build as more risky, but they felt they were well positioned to manage risk. As the designer, the design/build contractor takes on the risk of any design flaws; and presumably, this risk may be factored into their bid. Therefore, the preference for design/build may be contributory to price increases on LACMTA bids. However, recent smaller design/bid/build projects at LACMTA receiving 8+ bids are also coming in over estimate, so the higher prices seem to remain constant with either delivery method. Therefore, we cannot accurately assess if delivery method is a significant impact.

### **Risk**

Aside from labor, material, and competition, risk is the biggest determinant of project cost, especially on large, complex, multi year projects. Contractor interviews indicate LACMTA is perceived as more risk averse than most agencies, and assigns more risk to the contractor than is industry standard. Saylor has not performed any review of any actual LACMTA processes and procedures; therefore, this analysis is primarily based on the contractor survey coupled with Saylor’s understanding of the market in general.

Insurance Risk: LACMTA’s insurance requirements are perceived as higher than industry standard, and contractors indicated this can add to the cost of the work. One contractor mentioned on one LACMTA project, insurance costs were more than 5.5% of the work. This could be a contributory factor to LACMTA’s rising costs.

Bonding Risk: Some contractors indicated on some projects LACMTA required no limitations on liability making it difficult to secure a bond. Bonding requirements in excess of industry standard can add to the cost. Additionally, the length of the mega projects (\$600 million +) requires the contractor hold the bond for six to nine years. Unlike design/bid/build, the contractor has to hold the bond for one to two years during design prior to even starting construction.

Unforeseen Conditions Risk: The contractor interviews suggest this is considered a high risk on LACMTA projects. The contractors indicated their perception is the contractor is required to assume more responsibility for this risk than is industry standard. Contractors reported this risk often varies depending on the project manager. It is likely unforeseen conditions risk is a contributory factor to LACMTA's cost increases. Reports indicate LACMTA is making efforts to reduce this risk with advanced utility packages on larger projects.

Delays Due to Third Party Approvals: Contractors also felt this was a high risk. Contractors feel they have little control over the complex relationships between Caltrans, City and County of Los Angeles, and delays in approvals have a great potential to increase costs on the project. This is a probable contributory factor to LACMTA's rising costs.

Delays in Change Order Processing: Most contractors indicate even if a change (due to unforeseen conditions/delay) is approved, it is likely that compensation will be delayed due to the three tiered change order processing system. Again, Leland Saylor Associates has not performed an audit of LACMTA's change order processing procedures, so our analysis is only based on contractor reports. As contractors report it, the change is negotiated by the construction manager, then sent to an internal review group at Metro, and then forwarded to the board for approval. The contractors' perception is all changes over \$1 million require board approval. They report this can commonly delay processing for six to seven months, and often much longer. A possible contributory factor to this risk is the likelihood that DBE contractors may be affected by this delay, and the contractor may have to pay the DBE subs prior to being paid, to avoid subcontractor failure. We do not have enough data to determine if this is a common practice among contractors. Contractors report many owners have delays in change processing, but it is a risk that adds cost to the bid.

### **Mega Project Risk**

Analysis of mega project trends indicate that there are larger, unquantifiable risks in transit mega projects (\$600 million +), and contractors may be more sensitive to these risks than engineers or agencies. For owners or engineers, the risk is the project may go over budget; for a contractor, on mega projects, there is a real possibility that improper calculation of risks may result in severe financial consequences or even failure of the company.

Additionally, risk in transit mega projects is substantially greater than buildings mega projects. Buildings mega projects, especially those in remote locations, such as a prison, require fewer approvals, fewer interactions with the public, and generally provides more control for the contractor. In transit mega projects, the construction can go on for four to six years, requiring hundreds of approvals from numerous agencies, magnified potential for unforeseen conditions, delays due to requirements of keeping transit corridors open to the public, and potential, unknown increases in labor and material. Because risks are multiplied exponentially in mega projects, risk premiums can increase substantially.

Anecdotally, three mega projects in the California 2012-2013 timeframe—Crenshaw/LAX Transit Corridor, SF Muni 3<sup>rd</sup> Street Light Rail, and the Transbay Transit Center—all came in significantly over engineer’s estimates. All three were in dense urban environments, let by agencies with more complex administrative requirements. A cautionary tale is the New York MTA East Side Access project, another dense urban project. The project is currently \$4.4 billion over budget and 10 years behind schedule. The agency ascribes the increases in budget and schedule to “overly aggressive schedules; the number of large concurrent infrastructure projects; a contractor that performed poor quality work; and unforeseen construction challenges”.

From our interviews, it appears the four biggest risks perceived by the LACMTA contractor pool are:

- Unforeseen conditions
- Delays in approvals
- Delays in change order processing
- Magnification of risk inherent in mega projects

#### **Summary of Assessment of Causes of Price Increases**

In short, evidence points to all signs of a recovering market, both within LACMTA and in the Southern California market as a whole. The effects of recovering market, causing a 19% increase in heavy and civil construction employment 2011-2013, is intensified in the LACMTA bidding pool, and this effect is likely due to LACMTA specific requirements, processes and procedures. The nature of the specific differences perceived in the LACMTA environment are: higher administrative burden and higher risk, with the risk of unforeseen conditions and delays in third party approvals, coupled with the likelihood of delayed change order processing, being the greatest risks. Lastly, the vast majority (in dollar volume) of LACMTA’s program consists of mega projects (\$600 million +) that span four to six years, which amplifies all the previous risks mentioned.

#### **Projection in Future Pricing**

Given the infrastructure market is pointing to a gradual recovery, absent any changes in LACMTA contractual requirements, processes and procedures; it is expected pricing for 2013 will remain constant. Given that bids received by LACMTA are exceeding budgets by 15 to 20%, it is recommended that LACMTA have its engineering vendors update their estimating methodology to more accurately reflect the current pricing now evident in the LACMTA market.

#### **Recommendations for Future Escalation:**

##### **Labor and Material Escalation**

Again, assuming no changes in LACMTA’s requirements, processes and procedures, Saylor recommends including a minimum of 3% escalation for 2014. Current raises in prevailing wage in the Los Angeles region for carpenters, tunnel workers and laborers show 2.7% to 3% increases for 2013 and 2014; operating engineers are showing no increase, and iron workers are at 1.7% for 2013 and 2014. Therefore, we do not believe labor wages in the

infrastructure market will increase over 2.5% to 3% in the 2014 timeframe. Materials costs are stable, and should escalate in the 2 to 3% range. Therefore, costs associated with actual labor and materials prices will likely hover in the 2.5% to 3% range, moving up to 3.5% 2015-2017 if the economy continues its upward trajectory.

### **Bid Escalation**

Aside from major changes in labor and material escalation, the greatest impact on prices in a busy construction economy comes from:

- Reduction in productivity due to less experienced workers
- Increases in margin—Contractors and subcontractors can charge what the market will bear. There is a general lessening of competition, and there are fewer bidders on each project.

Saylor believes the greatest potential for bid price increases lies in this area. If construction spending actually increases the 24% that Dodge predicts in the 2014 timeframe, then other markets may draw labor from the infrastructure pool and the increasing infrastructure demands on the LACMTA pool will likely increase bids higher than labor and material would warrant. Currently, LACMTA is receiving only two and a half to three bids average in the \$3 million and up category; even the loss of one bidder from the current low number may result in increases to bid costs.

Bid costs tend to track the general escalation in labor and material, except immediately after a recession, bid volatility can cause wide swings in pricing. After the 2001 – 2003 recession, labor, material and margins soared as a depleted workforce was suddenly in demand to build houses, roads, and other public infrastructure to support the housing boom. Skilled workers in short supply drove near double digit percentage increases in bid prices, far in excess of actual labor and material increases

Parallels with 2001 – 2004 economic cycles exist today. Because of the construction capacity destruction caused by years of low volumes, the escalation has the potential to rise rapidly once the recovery in housing takes hold.

In addition, the increased DBE goals upcoming in October 2013, and the fact it is a race conscious goal, may push costs even higher.

It is rare one agency in one geographical area lets so much work in such a short period of time so exact predictions on how this will affect bid pricing is difficult to determine. If Dodge's predictions are true, and Los Angeles construction starts increase 24% in 2014, then price increases would likely be 5% or even more during the latter part of 2014.

With \$5 billion worth of LACMTA work breaking ground in 2015, we believe this may put great demands on the infrastructure contracting and labor pool. While we do not expect wages and materials to escalate higher than 3-4%, the vast amounts of LACMTA work breaking ground in 2015, coupled with the general recovery of the construction economy, may significantly impact bid prices in the 2015-2017 timeframe.

In the recovery from the last recession in 2005, labor and material prices rose 5.7%, while in-place subcontractor costs rose 9.2%, far in excess of actual labor and materials increases. Should the economy recover quickly, then bid prices (in the short term) may increase at a pace far in excess of actual labor and material increases.

In such times of flux, it is difficult to predict the exact effect of events yet to occur. However, Saylor sees the risk of increasing demands of the construction market, coupled with the increasing demands of the LACMTA program, as a significant risk. As such, it is recommended that LACMTA also consider a 5 to 10% market contingency on top of labor/material escalation to provide contingency for likely constraint driven pricing spikes.

## F. Sources for Information Included in this Report

Bureau of Economic Analysis

Bureau of Labor Statistics, State and Local Construction Employment

Bureau of Labor Statistics, State and Area Employment

California Employment Development Department (Data library)

Department of Labor

Dodge Reports

International Monetary Fund (IMF)

LAED Economics

McGraw Hill Construction Market Outlook

The Anderson Report

Reed Construction Data

U.S. Census Bureau

U.S. Council of Economic Advisors

### III. Appendix

## Selected Infrastructure Bids 2012-2013

\*Not included in the charts below (removed items that are outliers in the variance %- variance higher than 50% or lower than -50%)

Item	Bid Date	Project Description	Engineer Estimate	Low Bid	Variance %	# of Bids	Owner/Contact
<b>Group 1 (\$0 - \$10M)</b>							
1*	10/24/2012	SANTA CLARA COUNTY GUADALUPE LIGHT RAIL CORRIDOR OCS (Contract #: C12095F)	\$2,000,000	\$5,689,000	184.5%	3+	SANTA CLARA VALLEY TRANSPORTATION AUTH
2*	11/28/2012	FSP CADOT FEATHER RIVER BRIDGE: RETROFIT STEEL MEMBERS, BRIDGE DECK (Contract #: 03-1E5104)	\$3,470,443	\$5,438,398	56.7%	5	CA-DOT
3	3/6/2013	EDINGER AVENUE BRIDGE	\$5,109,193	\$5,460,789	6.9%	8	ORANGE CO- PW/CENTRAL FILES/CASHIE
4	7/2/2013	LINDERO CANYON ROAD BRIDGE	\$5,440,000	\$5,469,444	0.5%	3	WESTLAKE VILLAGE- CLERK
5	10/23/2012	SANTA CLARA COUNTY GUADALUPE CORRIDOR TPSS (Contract #: C12096F)	\$5,500,000	\$5,689,000	3.4%	4	SANTA CLARA VALLEY TRANSPORTATION AUTH
6	4/26/2013	CADOT VARIOUS BRIDGES (Contract #: 01-0A4404)	\$5,772,955	\$5,446,797	-5.6%	3	CA-DOT
7	1/24/2012	CHICO ROUTE SR 32 PHASE 1: State Route 32 Widening Project (Phase 1) Project No. 15010 from East of Park and Ride Lot to El Monte Avenue (Contract #: 15010)	\$6,000,000	\$5,474,421	-8.8%	3	CHICO-CAPITAL PROJECTS SERVICES DEPT

8	1/19/2012	RIVERSIDE COUNTY DAY CREEK CHANNEL STAGE 6 PHASE 2 (Contract #: 1-0-00250-06)	\$6,000,000	\$5,138,077	-14.4%	13	RIVERSIDE CO FLOOD CONTROL WATER DIST
9	2/7/2013	MAIN STREET BRIDGE (Contract #: 188A)	\$6,200,000	\$4,770,079	-23.1%		TEMECULA-PUBLIC WORKS
10	6/12/2013	SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY TRACK: Track Rehabilitation Services (Contract #: JO115-13)	\$6,412,814	\$6,329,456	-1.3%	3+	SOUTHERN CA REGIONAL RAIL AUTHORITY
11	11/6/2012	LOMA LINDA STEWART STREET UNDERPASS & PEDESTRIAN BRIDGE (Contract #: CIP 08-145)	\$6,438,000	\$5,499,854	-14.6%	5	LOMA LINDA-PUBLIC WORKS DEPT
12	6/20/2013	INTERMODAL TRANSIT CENTER SAN FRANCISCO BAY TRAIL (Contract #: 63001A)	\$8,340,000	\$7,582,340	-9.1%	2	HERCULES-OFFICE OF THE CITY CLERK
13	6/5/2013	MCBEAN PARKWAY BRIDGE WIDENING (Contract #: ENG-12-13-S1037)	\$7,100,000	\$6,728,472	-5.2%	5	SANTA CLARITA-PUBLIC WORKS
14	12/11/2012	CADOT VARIOUS BRIDGE DECKS POLYESTER OVERLAY (Contract #: 02-2E2914)	\$7,231,252	\$6,419,828	-11.2%	7	CA-DOT
15	1/15/2013	CADOT VARIOUS PLACE & WIDEN HMA ROADWAY (Contract #: 04-2A4404)	\$7,588,286	\$7,540,535	-0.6%	8	CA-DOT
16	5/2/2013	INTERSTATE 15 & LOS ALAMOS ROAD OVERCROSSING (Contract #: CIP 08311)	\$7,693,554	\$6,355,000	-17.4%	9	MURRIETA-CITY HALL
17	2/26/2013	CADOT VARIOUS PAVE ELECTRICAL BEACONS & BRIDGE (Contract #: 03-3E6204)	\$8,090,643	\$7,371,737	-8.9%	7	CA-DOT

18	3/20/2013	LINCOLN AVENUE WIDENING	\$8,515,389	\$8,181,675	-3.9%	9	ORANGE CO- PW/CENTRAL FILES/CASHIER
19	4/10/2012	FSP LOS ANGELES KANAN ROAD TUNNEL LINING: Kanan Road, Tunnel 2 and Tunnel 3 Lining (Contract #: RDC0015367)	\$8,607,570	\$7,180,813	-16.6%	4	LOS ANGELES CO- PUBLIC WORKS DEPT
20	2/2/2012	Tecolote and Washington Crossovers & Signals (Contract #: 5001573)	\$9,000,000	\$6,107,283	-32.1%	4	SAN DIEGO- ASSOCIATION OF GOVERNMENTS
21	4/30/2013	CADOT ABBOTT DRIVE BRIDGE (Contract #: 06-0H1804)	\$9,301,100	\$7,841,099	-15.7%	6	CA-DOT
22	2/26/2013	FSP PLANO STREET BRIDGE: Plano Street Bridge at Tule River Project (Contract #: 12/13-CP1788)	\$9,343,500	\$10,464,506	12.0%	3	PORTERVILLEPURCHA SING & FINANCE DEPT
23	1/17/2013	CADOT VAN WINKLE WASH BULB TEE GIRDER BRIDGE: BRIDGE REPLACEMENT (Contract #08- ON5904)	\$9,390,309	\$10,245,702	9.1%	6	CA- Transportation Procurement & Contract

### Group 2 (\$10-20M)

24	5/16/2013	PUTAH CREEK BRIDGE NO 23C0243: Winters Road Bridge. (Contract #: BRLO-5923(067))	\$8,500,000	\$11,608,619	36.6%	7	SOLANO CO-PUBLIC WORKS/ENGINEERING
25	1/24/2012	MODESTO CARPENTER ROAD BRIDGE SEISMIC: Carpenter Road Bridge Seismic Retrofit Project (Contract #:2012-02)	\$10,812,446	\$8,195,135	-24.2%	8	MODESTO-PUBLIC WORKS & ENGINEERING PARKS & RECREATION

26	10/24/2012	SACRAMENTO RAILYARDS AT 6TH STREET: 6th Street at Sacramento Railyards Project (Contract #: T15116200)	\$10,900,000	\$10,157,331	-6.8%	6	SACRAMENTO-CLERKS OFFICE
27	5/6/2013	BIJOU AREA EROSION CONTROL PHASE 1 (Contract #:12-30140033-BN)	\$11,318,967	\$10,957,914	-3.2%	5	SOUTH LAKE TAHOE-ENGINEERING DIVISION
28*	4/4/2013	SAN TOMAS AQUINO CREEK BOX CULVERT	\$11,419,000	\$5,501,183	-51.8%		SANTA CLARA CO-BOARD OF SUPERVISORS
29	10/4/2012	ANTIOCH WILBUR AVENUE BRIDGE OVERHEAD WIDENING: Wilbur Avenue Overhead Widening Bridge (Contract #: 28C-0054)	\$11,600,000	\$10,306,984	-11.1%	6	Antioch-City Clerk
30	11/8/2012	TULARE UPRR TRACKS & BARDSLEY AVENUE GRADE SEPARATION (Contract #: 12-020)	\$11,700,000	\$10,706,255	-8.5%	6	TULARE-CITY CLERK
31	3/27/2013	SOTO STREET BRIDGE OVER MISSION ROAD (Contract: E700071F)	\$13,166,800	\$9,169,044	-30.4%	6	LOS ANGELES-PUBLIC
32	5/30/2013	CADOT LAUREL STREET BRIDGE SEISMIC (Contract #: 11-264114)	\$13,728,815	\$16,548,443	20.5%	4	CA-TRANSPORTATION PROCUREMENT & CONTRACT
33	5/31/2012	Traction Power Substation (Contract #: 5001999)	\$14,025,760	\$12,946,533	-7.7%	3	SAN DIEGO-ASSOCIATION OF GOVERNMENTS (SANDAG)

34	1/31/2013	OAKLAND 10TH STREET LAKE MERRITT CHANNEL: The Lake Merritt Channel Improvement At 10th Street (Contract #: C277110)	\$14,500,000	\$14,804,476	2.1%	4	OAKLAND-PUBLIC CONTRACT ADMINWORKS
35	10/31/2012	FSP CADOT BRIDGE DECK RET WALL CONC BARRIER PLACE HMA (Contract #: 04-1A3204)	\$15,298,815	\$14,895,223	-2.6%	3	CA-DOT
36	10/18/2012	CADOT 4 BRIDGE DECKS COLD PLANE & HMA PAVEMENT: COLD PLANE, HMA, POLYESTER CONCRETE (Contract #: 08-448304)	\$15,842,869	\$10,483,960	-33.8%	4	CA- Transportation Procurement & Contract
37	2/25/2013	Mid- City Rapid Bus Transit (Contract #: 5004073)	\$16,201,564	\$10,952,589	-32.4%	5	SAN DIEGO- ASSOCIATION OF GOVERNMENTS (SANDAG)
38	3/5/2013	GLEN HELEN PARKWAY GRADE (Contract #: H14057)	\$16,463,285	\$18,086,298	9.9%	10	SAN BERNARDINO CO- PUBLIC WORKS DEPT
39	12/6/2012	LA WATERFRONT-DOWNTOWN HARBOR LANDSIDE & RAIL (Contract #: 2739)	\$18,000,000	\$19,693,330	9.4%	5	The Port of Los Angeles- Construction DIV
40	1/4/2012	Beach San Replacement (Contract #: 5001564)	\$19,950,304	\$23,817,200	19.4%	4	SAN DIEGO- ASSOCIATION OF GOVERNMENTS (SANDAG)

**Group 3 (\$20-80M)**

41	6/19/2013	WILMINGTON AVENUE INTERCHANGE	\$20,000,000	\$16,422,930	-17.9%	6	CARSON-CITY CLERK
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42	5/9/2013	LARKSPUR FERRY TERMINAL: M.S. San Francisco Ferry (Contract #2013-FT-13-->new contract #2013-FT-15)	\$20,000,000	\$18,474,798	-7.6%	3	GOLDEN GATE BRIDGE HIGHWAY & TRANSP DIST
43	1/10/2012	HUNTS LANE GRADE SEPARATION (Contract #: C11184)	\$20,000,000	\$14,213,969	-28.9%	7	SAN BERNARDINO ASSOCIATED GOVERNMENTS
44	6/20/2013	LOS ANGELES BERTH 200 RAIL YARD TRACK CONNECTIONS (Contract #: 2745)	\$22,560,860	\$18,310,275	-18.8%	4	THE PORT OF LOS ANGELES CONSTRUCTION DIV
45	6/25/2013	OAKLAND RUNNING RAIL & TRACKWORK: Procurement of Running Rail, Crossties, Resilient Ties and Special Trackwork (Contract #: 04SF-150)	\$24,000,000	\$23,646,695	-1.5%	2	BAY AREA RAPID TRANSIT DISTRICT (BART)
46	7/16/2013	SAN DIEGO COUNTY DOUBLE TRACK STAGE 1 (Contract #: 5001515)	\$24,300,000	\$18,833,800	-22.5%	6	SAN DIEGO-ASSOCIATION OF GOVERNMENTS (SANDAG)
47	10/31/2012	STANISLAUS COUNTY SR 99 & SR 219 INTERCHANGE	\$28,456,000	\$24,934,987	-12.4%	6	STANISLAUS CO-BOARD OF SUPERVISORS
48	2/22/2012	CADOT ACCESS BRIDGE & RETAINING WALLS (Contract #:04-297614)	\$29,000,000	\$20,409,143	-29.6%	12	CA-DOT
49	7/16/2013	CADOT PAVEMENT & BRIDGE (Contract #: 10-OG8004)	\$29,237,766	\$29,049,024	-0.6%	10	CA-DOT
50	11/29/2012	CADOT ROUTE 91 WESTBOUND RAMPS & BRIDGE WIDENING (Contract #: 12-OC5704)	\$35,094,987	\$31,135,509	-11.3%	6	CA- Transportation Procurement & Contract

51	12/6/2012	CADOT STRUCTURE & DIRECT ACCESS RAMP (Contract #: 11-2T1824)	\$38,252,737	\$37,602,648	-1.7%	5	CA- Transportation Procurement & Contract
52	11/15/2012	LOS ANGELES COUNTY STATE ROUTE 126 COMMERCE CENTER DRIVE	\$41,005,717	\$35,387,229	-13.7%	7	LOS ANGELES CO-PUBLIC WORKS DEPT
53	1/4/2012	SAN BERNARDINO COUNTY I-10/CITRUS AVENUE INTERCHANGE (Contract #: C12036)	\$44,000,000	\$32,671,406	-25.7%		SAN BERNARDINO ASSOCIATED GOVERNMENTS
54	3/21/2012	CADOT BRIDGES ROADWAY & ELECTRICAL:Construct Bridges and Roadway, and Electrical System (Contract #: 04-0120M4)	\$45,100,000	\$31,461,639	-30.2%	5	CA-DOT
55	12/14/2012	SAN DIEGO COUNTY BLUE LINE STATION: Blue Line Stations Improvement Project (Contract #: 5001933)	\$81,085,330	\$57,881,710	-28.6%	4	SAN DIEGO-OF GOVERNMENTS ASSOCIATION (SANDAG)
56	10/15/2012	SOUTH WILMINGTON GRADE (Contract #: 2690A)	\$55,397,000	\$50,643,125	-8.6%	2	The Port of Los Angeles- Construction DIV

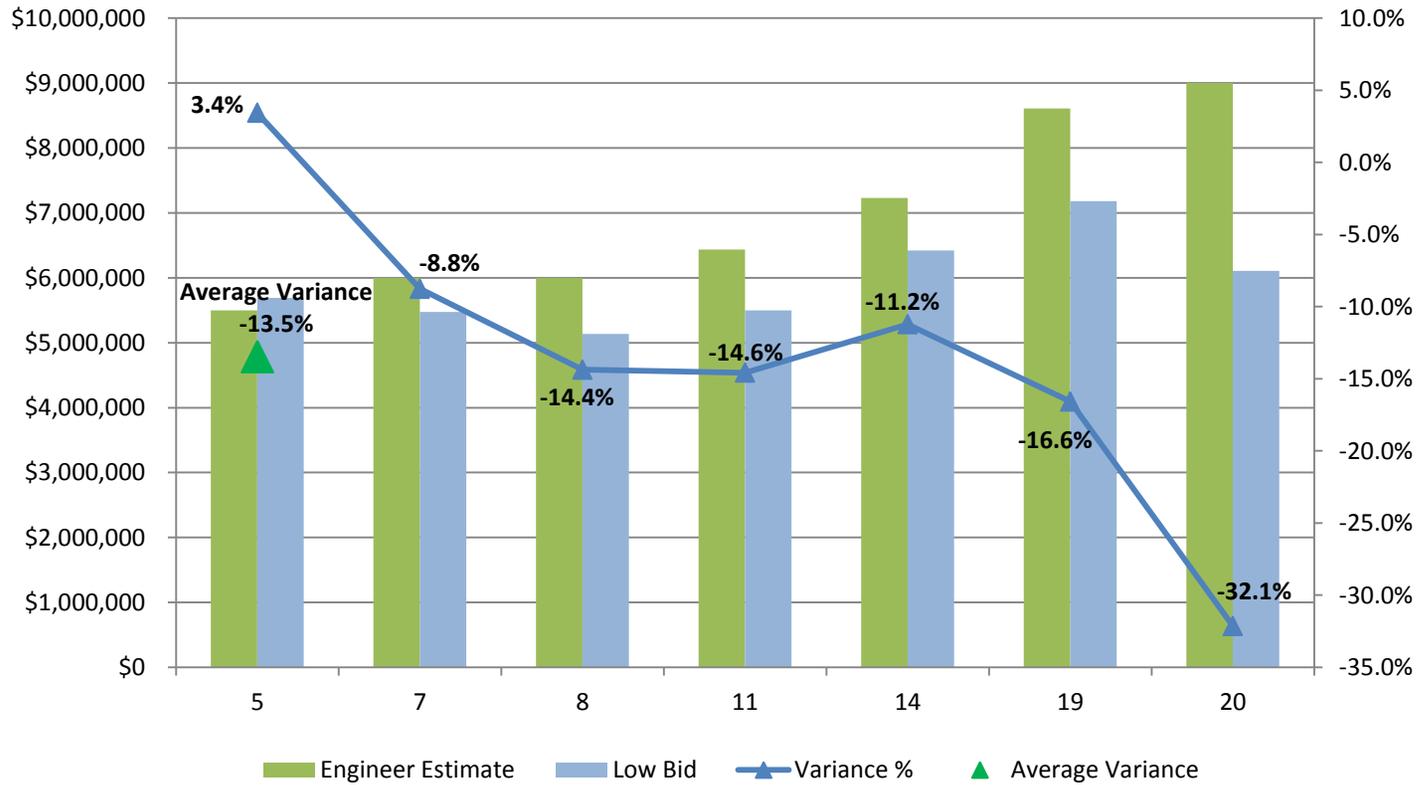
#### Group 4 (\$80M+)

57	4/23/2013	EXPOSITION LRT PHASE 2 OPERATIONS & MAINTENANCE (Contract #: XP8902-016)	\$87,950,738	\$99,930,560	13.6%	4	EXPOSITION METRO LINE AUTHORITY
58	10/11/2012	CADOT RETAINING WALLS BRIDGES & WIDEN ROADWAY: WIDEN ROADWAY WITH HMA (Contract #: 08-0M94U4)	\$134,760,491	\$132,655,886	-1.6%	6	CA- Transportation Procurement & Contract
59	12/18/2012	PERRIS VALLEY LINE COMMUTER RAIL (Contract #:13-33-049-00)	\$144,067,379	\$132,202,749	-8.2%	6	RIVERSIDE CO TRANSPORTATION CMMSSN(RCTC)

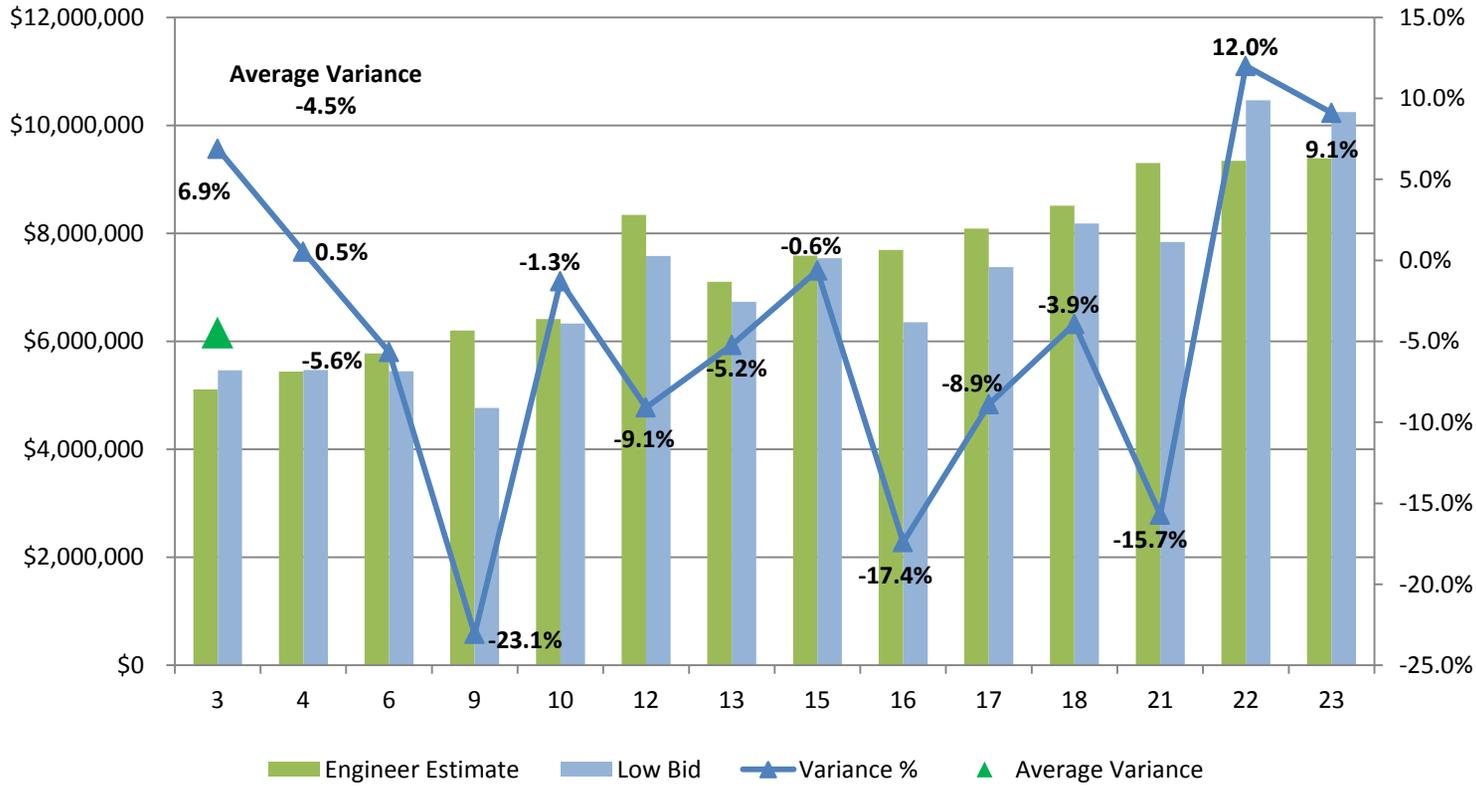
60	2/9/2012	CADOT ROUTE 710 ROADWAY & BRIDGES: Pave roadway with long life pavement and widen roadway and bridges (Contract #: 07-202114)	\$170,000,000	\$102,593,895	-39.7%	6	CA-TRANSPORTATION PROCUREMENT & CONTRACT
61	10/4/2012	FSP CADOT ROUTE 5 & RAILROAD TRACKS & RAMPS: REALIGN ROUTE 5 AND RAILROAD TRACKS (Contract #: 07-1218W4)	\$201,633,261	\$147,342,194	-26.9%	5	CA- Transportation Procurement & Contract
62	6/12/2012	SAN FRANCISCO CENTRAL SUBWAY CHINATOWN STATION PHASE 2: Third Street Light Rail Program-Phase 2 (Contract #: 1254)	\$235,000,000	\$239,420,700	1.9%	3	SAN FRANCISCO-MUNICIPAL TRANSPORTATION
63	4/18/2013	THIRD STREET LIGHT RAIL PHASE 2 (Contract #: 1300)	\$750,000,000	\$840,067,000	12.0%	3	SAN FRANCISCO-MUNICIPAL TRANSPORTATION

Average Variance	Data chart	Notes (Items not included in average variance)
-13.5%	2012 Eng Est and Low Bid (Group 1)	1, 2
-4.5%	2013 Eng Est and Low Bid (Group 1)	n/a
-7.3%	2012 Eng Est and Low Bid (Group 2)	n/a
0.4%	2013 Eng Est and Low Bid (Group 2)	28
-19.1%	2012 Eng Est and Low Bid (Group 3)	n/a
-11.5%	2013 Eng Est and Low Bid (Group 3)	n/a
-14.9%	2012 Eng Est and Low Bid (Group 4)	n/a
12.8%	2013 Eng Est and Low Bid (Group 4)	n/a

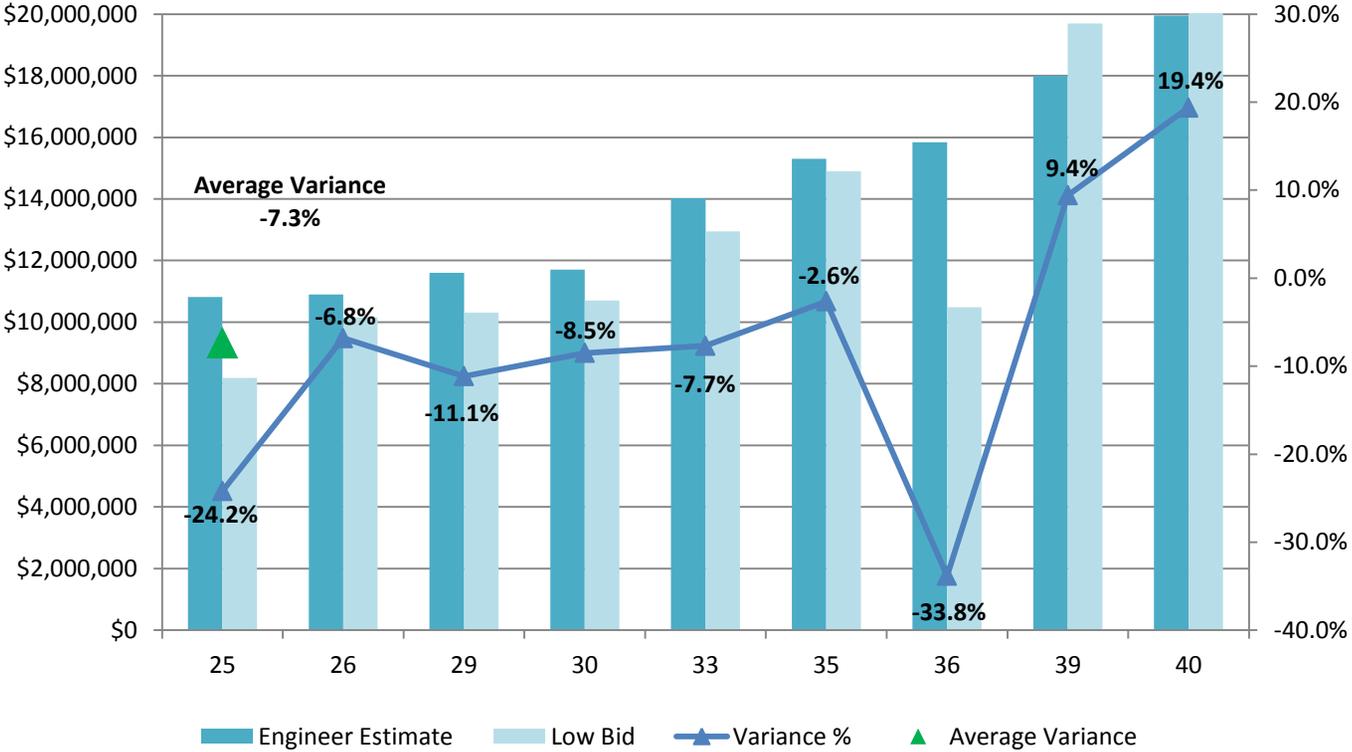
## 2012 Engineer vs Low Bid Variance (Group 1: \$0-10M)



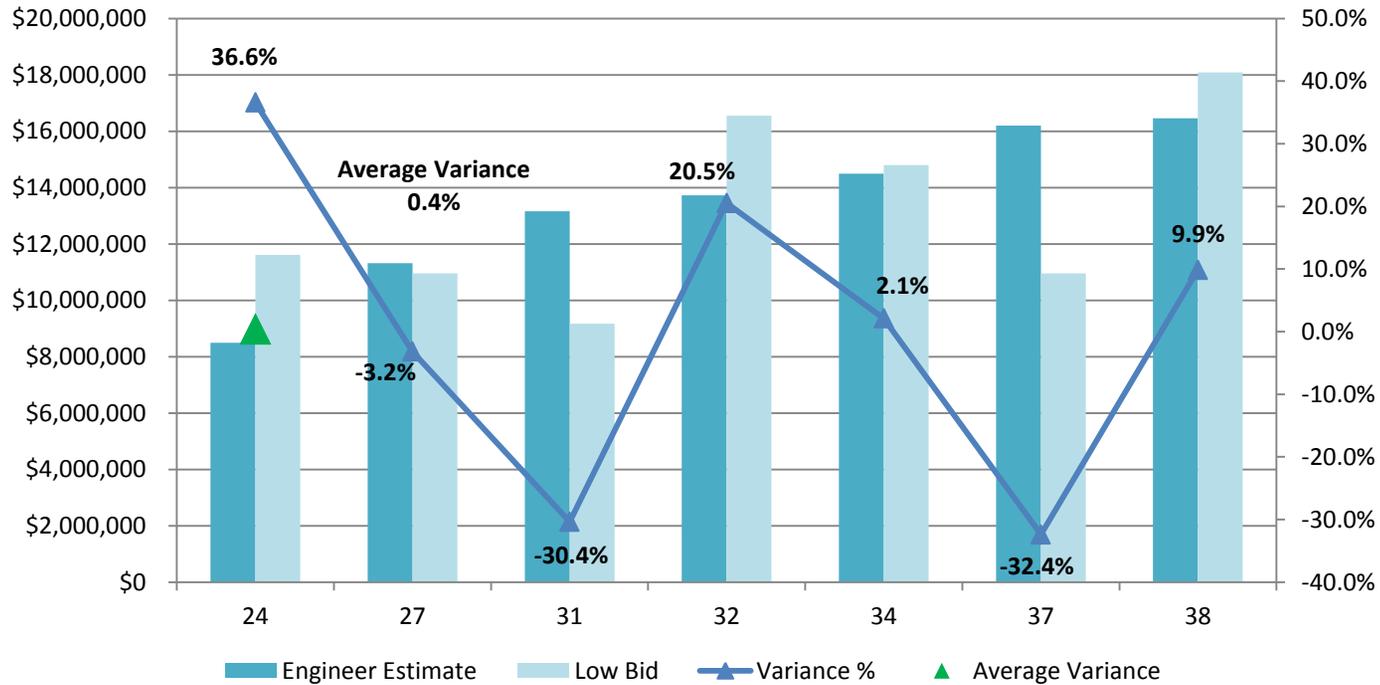
## 2013 Engineer vs Low Bid Variance (Group 1: \$0-10M)



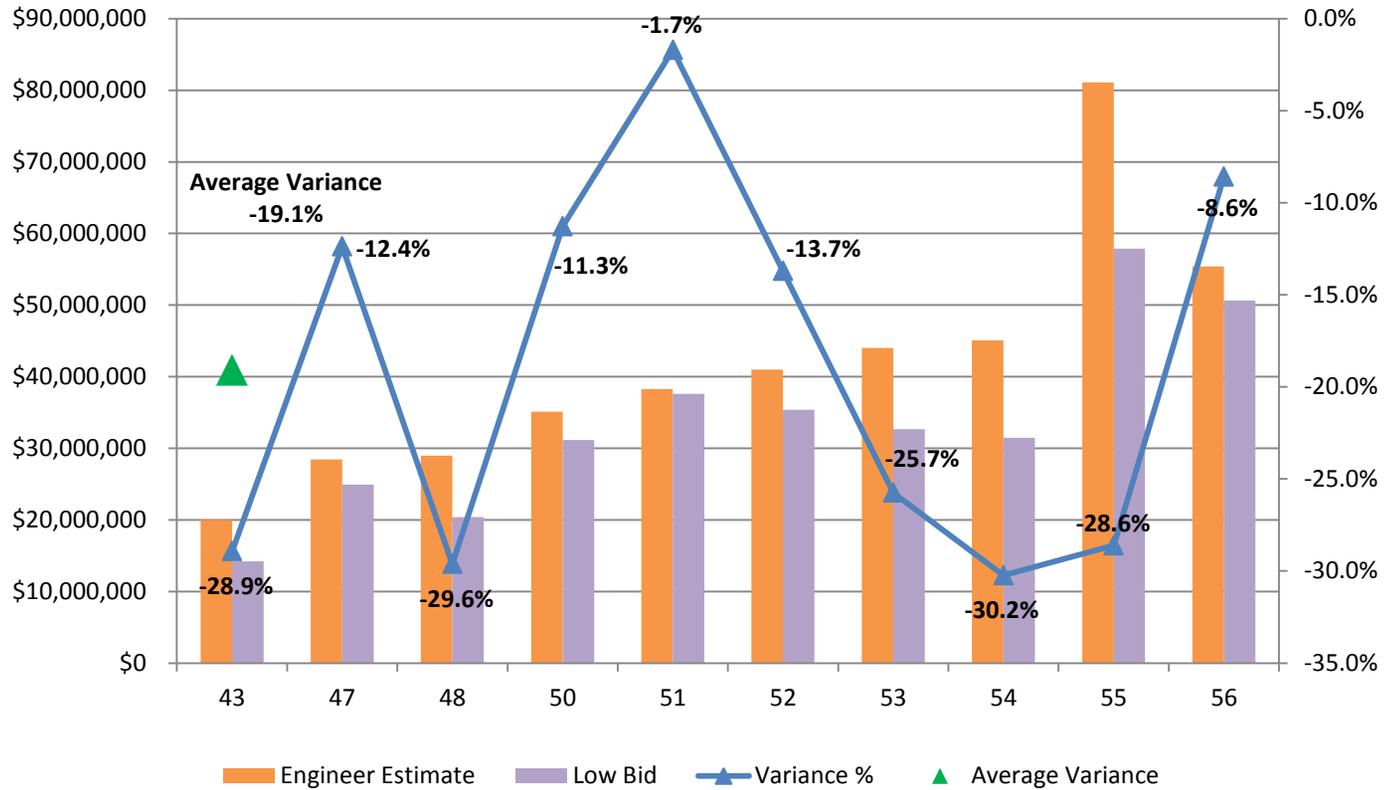
## 2012 Engineer vs Low Bid Variance (Group 2: \$10-20M)



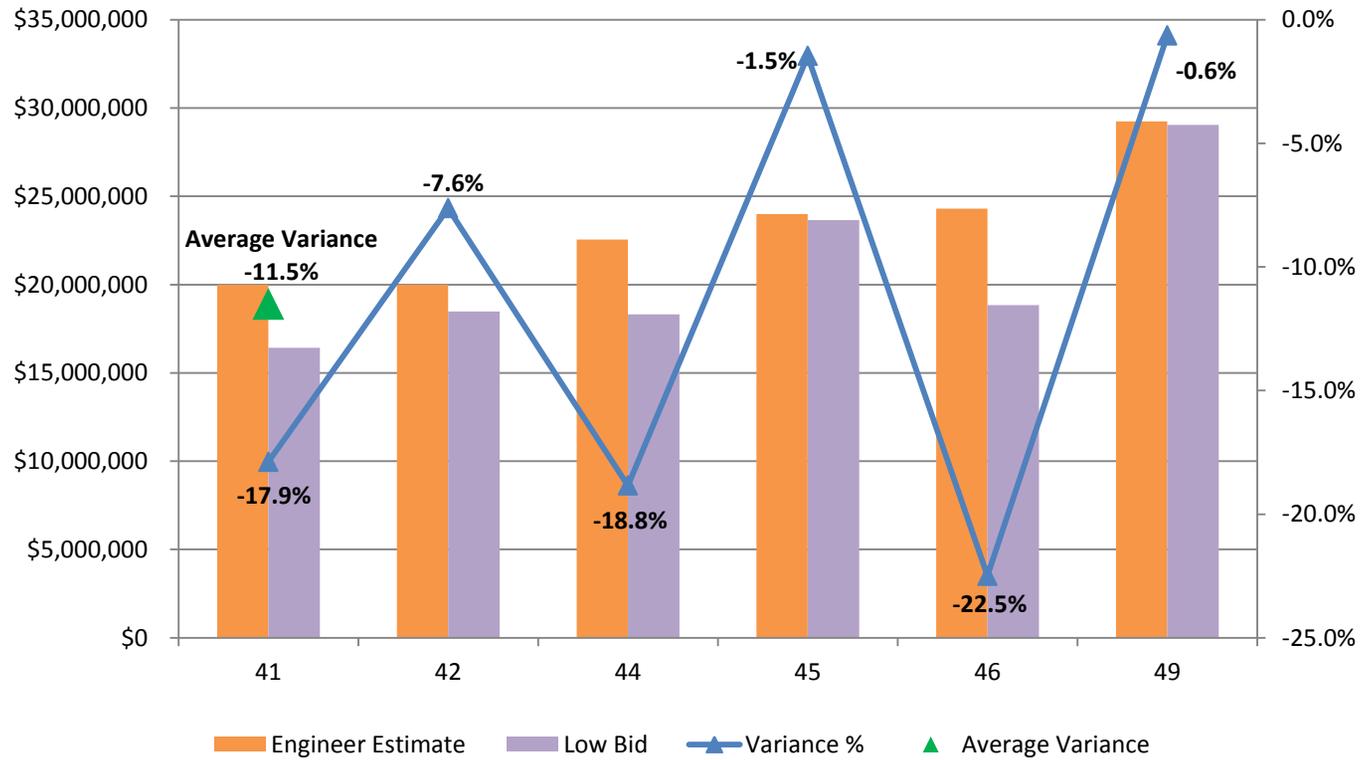
## 2013 Engineer vs Low Bid Variance (Group 2: \$10-20M)



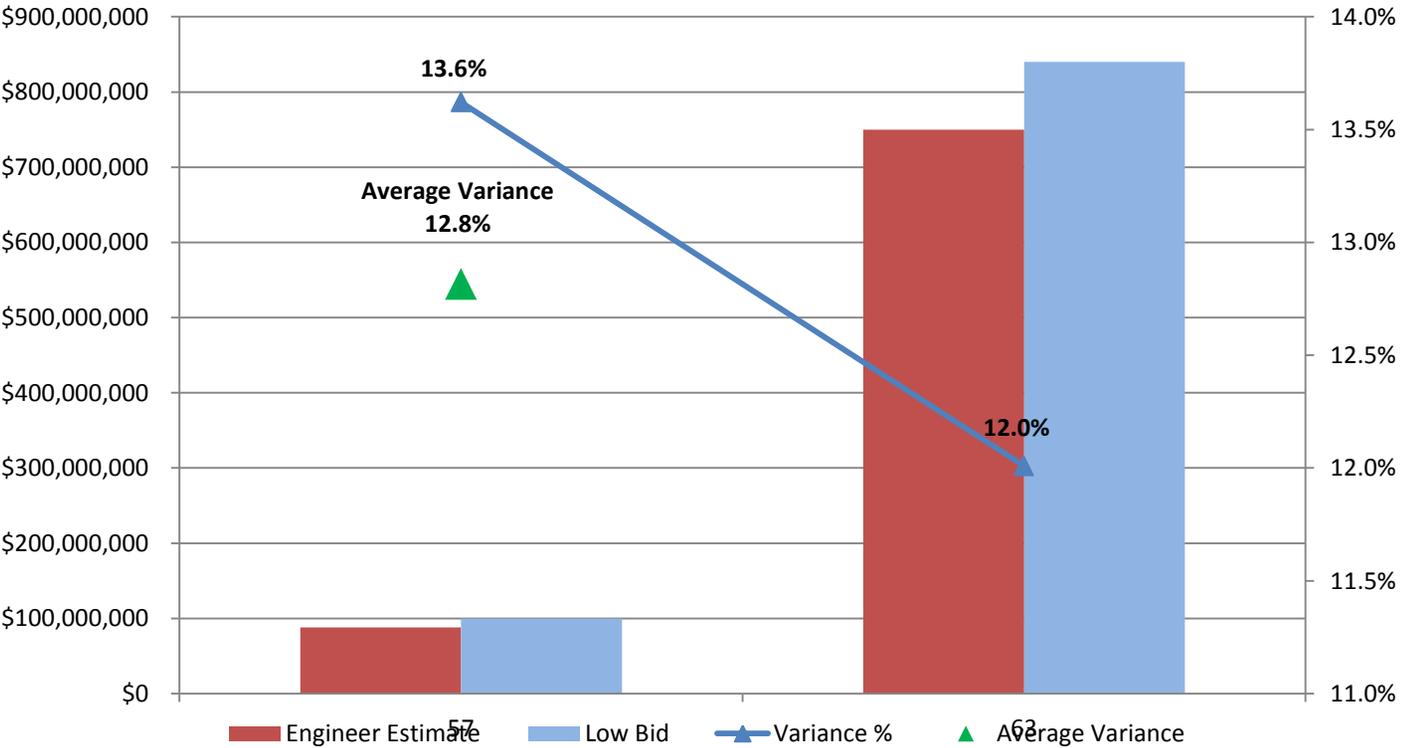
## 2012 Engineer vs Low Bid Variance (Group 3: \$20-80M)



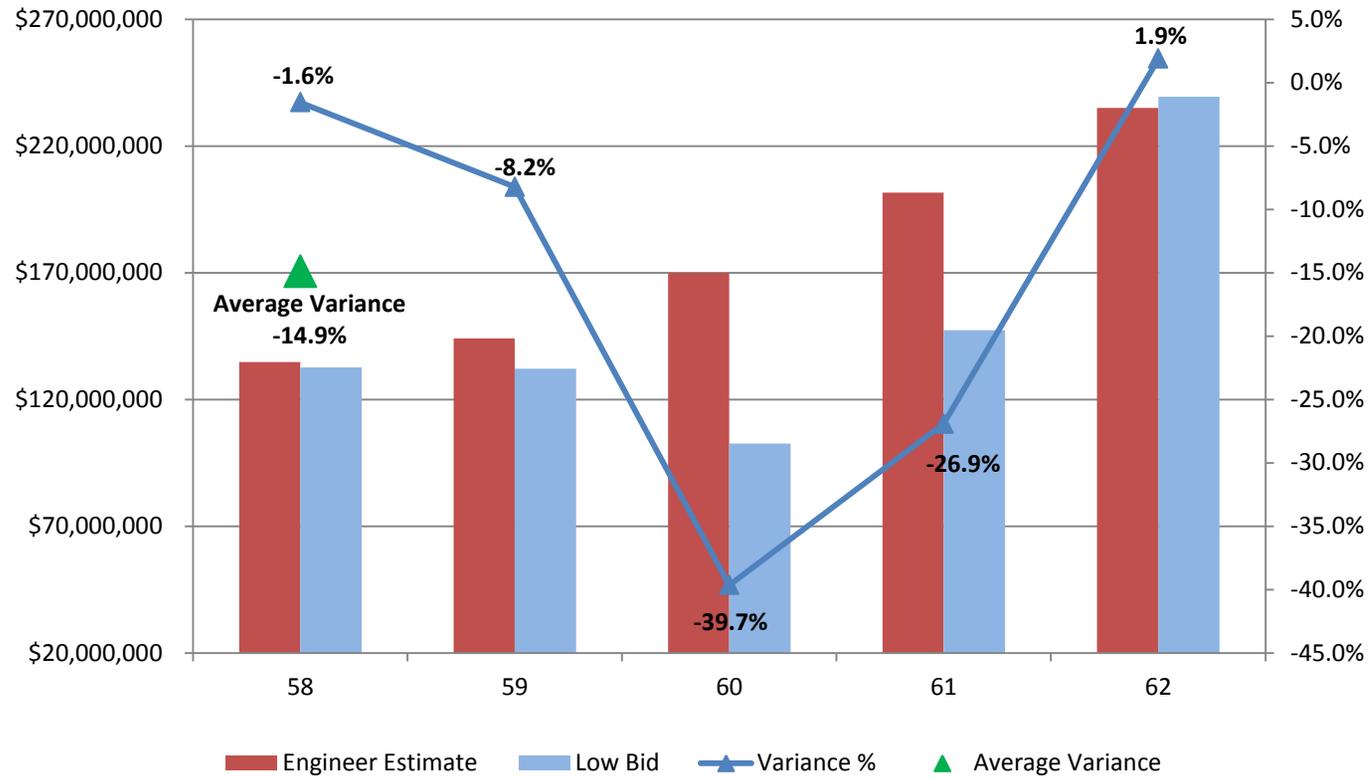
## 2013 Engineer vs Low Bid Variance (Group 3: \$20-80M)



## 2013 Engineer vs Low Bid Variance (Group 4: \$80M+)



## 2012 Engineer vs Low Bid Variance (Group 4: \$80M+)



## Selected Infrastructure Bids 2011

\*Not included in the charts below (removed items that are outliers in the variance %- variance higher than 50% or lower than -50%)

Item	Bid Date	Project Description	Engineer Estimate	Low Bid	Variance %	# of Bids	Owner/Contact
<b>Group 1 (\$0 - \$10M)</b>							
1*	11/30/2011	CADOT BRIDGE POLYESTER CONCRETE OVERLAY: Bridge Polyester Concrete Overlay, Clean/Paint Structural Steel (Contract #: 02-2E2904)	\$4,230,000	\$6,498,610	53.6%	4	CA-DOT
2	11/3/2011	SAN MATEO COUNTY BAY DIVISION PIPELINE 5 MICRO TUNNEL: BAY DIVISION PIPELINE RELIABILITY UPGRADE PROJECT (Contract #: WD-2665)	\$5,800,000	\$5,251,100	-9.5%	5	SAN FRANCISCO-PUBLIC UTILITIES BUREAU
3	11/30/2011	MADERA COUNTY ROAD 200 PHASE 2B: Construction of Road 200- Phase 2B: Road Re-alignment and Reconstruction (Contract #: 02-05B-RD)	\$5,900,000	\$6,405,197	8.6%	5	MADERA CO-RESOURCE MGMNT & ROAD DEPARTMENT
4	5/24/2011	REDDING STILLWATER BUSINESS PARK 1B (Contract #: 4397)	\$6,250,000	\$5,026,454	-19.6%	4	REDDING-CITY CLERKS OFFICE
5	11/30/2011	CADOT VARIOUS GRIND GROOVE CONCRETE PAVEMENT & PCC SLABS: Grind and groove concrete pavement and replace PCC slabs (Contract: 03-2F0404)	\$6,300,000	\$6,479,518	2.8%	7	CA-DOT
6	5/4/2011	SACRAMENTO NORWOOD AVENUE BRIDGE: Norwood Avenue Bridge Replacement Project (Contract #: B111500019)	\$6,700,000	\$7,719,585	15.2%	3	SACRAMENTO-CLERKS OFFICE

7	3/29/2011	SUPERLOOP TRANSIT PROJECT (Contract #: 5001201)	\$7,263,000	\$5,787,210	-20.3%	5	SAN DIEGO-ASSOCIATION OF GOVERNMENTS
8	8/16/2011	CADOT GREENWOOD CREEK BRIDGE & WIDEN ROADWAY (Contract #: 01-310104)	\$7,100,000	\$9,321,900	31.3%	3	CA-DOT
9	7/26/2011	VENTURA COUNTY CALLEGUAS CREEK PLEASANT VALLEY ROAD BRIDGE: Calleguas Creek Pleasant Valley Road to HWY 101 Western Bank & Channel Bed Improvement Sch I & ii (Contract #: WP11-18)	\$7,461,766	\$5,846,166	-21.7%	7	VENTURA CO-ENGINEERING SERVICES
10	5/18/2011	CADOT PAINT 3 BRIDGES-PAINTING (Contract #: 03-3M7104)	\$7,900,000	\$6,854,696	-13.2%	4	CA-DOT
11	3/17/2011	Santa Ana First Street Bridge: FIRST STREET BRIDGE REPLACEMENT OVER SANTA ANA RIVER (Contract #: 06-1723)	\$8,065,000	\$6,010,329	-25.5%	10	SANTA ANA-PUBLIC WORKS AGENCY
12	6/23/2011	CADOT WIDEN FREEWAY BRIDGE & RETAINING TIEBACK WALL: Widen Freeway and Bridge and Construct Retaining/Tieback Wall (Contract #: 12-0G9604)	\$8,520,000	\$8,957,959	5.1%	13	CA-TRANSPORTATION PROCUREMENT & CONTRACT
13	2/16/2011	LAGUNA NIGUEL CROWN VALLEY PARKWAY 2 BRIDGES WIDENING:Crown Valley Parkway/I-5 Widening Project (Contract #: 09-06)	\$8,600,000	\$5,862,139	-31.8%	5	LAGUNA NIGUEL-PUBLIC WORKS DEPT
14	3/25/2011	SANTA CLARA AGUA FRIA, TOROGES & AGUA CALIENTE CREEK: Freight Railroad Relocation (Contract #: C115 (11029))	\$9,325,623	\$5,291,700	-43.3%	3	SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

15	4/7/2011	FSP LA QUINTA ADAMS STREET BRIDGE: ADAMS STREET BRIDGE IMPROVEMENTS PROJECT (Contract #: 2006-06)	\$9,488,394	\$8,287,990	-12.7%	10	LA QUINTA-CITY CLERK
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**Group 2 (\$10-20M)**

16	11/3/2011	CADOT NORDAHL BRIDGE & WIDEN OFF RAMP: Replace Nordahl Bridge and Widen Off-Ramp (Contract #: 11- 259804)	\$10,000,000	\$11,133,985	11.3%	4	CA- TRANSPORTATION PROCUREMENT & CONTRACT
17	10/20/2011	SAN FRANCISCO N LINE & CARL STREET TRACK: N-Line Along Carl Street Track Improvement Project (Contract #:1248)	\$10,323,028	\$7,392,470	-28.4%	6	SAN FRANCISCO MUNICIPAL TRANSPORTATION
18	2/2/2011	Green Line Extension Station Platform Modifications (Contract #: 5001547)	\$10,360,000	\$8,421,737	-18.7%	6	SAN DIEGO- ASSOCIATION OF GOVERNMENTS
19	10/5/2011	CADOT ROUTE 101 BRIDGE WALLS RAMPS SEWER & WATER LINES: Construct Bridge, Retaining Walls, Ramps, Sewer and Water Lines (Contract #: 04-264044)	\$10,700,000	\$8,290,102	-22.5%	7	CA-DOT
20	12/20/2011	Downtown Station Platform Modifications (Contract #: 5001826)	\$12,850,000	\$8,313,557	-35.3%	4	SAN DIEGO- ASSOCIATION OF GOVERNMENTS
21	7/20/2011	Orange Line Station Platform Modifications Rebid (Contract #: 5001840)	\$13,500,000	\$12,782,513	-5.3%	2	SAN DIEGO- ASSOCIATION OF GOVERNMENTS

22	11/17/2011	HIGHLAND BOULDER AVENUE & EUCALYPTUS AVENUE: Boulder Avenue Improvements and Bridge Replacement over City Creek from 500 South of Base Line to Eucalyptus Avenue (Contract #: 2011-09)	\$13,600,000	\$8,185,929	-39.8%	12	HIGHLAND-PUBLIC WORKS DEPT
23	9/22/2011	CADOT OSO CREEK BRIDGE SLAB SLOPE PAVING GRIND GROOVE: Replace Slab, Approach Slab, Slope Paving, Grind/Groove Concrete Pvmnt, HMA Pvmnt (Contract #: 12-0E0304)	\$14,400,000	\$11,083,179	-23.0%	8	CA-TRANSPORTATION PROCUREMENT & CONTRACT
24	3/23/2011	SAN DIEGO COUNTY JOB ORDER CONTRACT RAILROAD: Job Order Contract Railroad Construction (Contract #: 5001582)	\$15,000,000	\$12,000,000	-20.0%		SAN DIEGO-ASSOCIATION OF GOVERNMENTS
25	4/28/2011	FSP CADOT RC SLAB BOX STRUCTURES & HIGHWAY: WIDEN RC SLAB, CIP RCB, AND CIP/PS BOX STRUCTURES AND HIGHWAY (Contract #: 07-241304)	\$15,600,000	\$16,776,352	7.5%	5	CA-TRANSPORTATION PROCUREMENT & CONTRACT
26	5/17/2011	CADOT WIDEN SHOULDER ROADWAY HMA & BRIDGE: WIDEN SHOULDERS AND BRIDGE, PLACE HMA ON ROADWAY, AND CONSTRUCT WALL (Contract #: 04-0A8404)	\$15,700,000	\$10,419,581	-33.6%	8	CA-DOT
27	12/14/2011	CADOT CARQUINEZ BRIDGES TIMBER FENDERS PIERS 2 & 3: Replace timber fenders piers 2 & 3, pile, and ring beams (Contract #: 04-049074)	\$16,346,947	\$16,268,778	-0.5%	6	CA-DOT
28	4/19/2011	CADOT VARIOUS ROADWAY & BRIDGE: WIDEN ROADWAY AND BRIDGE (Contract #: 04-0A1844)	\$17,000,000	\$11,369,047	-33.1%	3	CA-DOT

29	4/5/2011	CADOT WIDEN BRIDGES: Widen Bridges with PCPS Girders and Place HMA Over CL2 AB on Roadway (Contract #: 02-4C4014)	\$18,000,000	\$17,673,356	-1.8%	4	CA-DOT
30	11/29/2011	SACRAMENTO COUNTY AERIAL STRUCTURES CORRIDOR PHASE 2: South Sacramento Corridor Phase 2, Aerial Structures (Contract #: 410.08.01)	\$18,687,900	\$15,763,335	-15.6%	4	SACRAMENTO REGIONAL TRANSIT PROCUREMENT

**Group 3 (\$20-80M)**

31	5/10/2011	CADOT WIDEN ROADWAY & BRIDGES: WIDEN ROADWAY AND BRIDGES, CONSTRUCT RETAINING AND SOUND WALLS (Contract #: 03-3A0424)	\$22,100,000	\$23,853,753	7.9%	5	CA-DOT
32	2/16/2011	ORANGE COUNTY ANTONIO PARKWAY PHASE 1 2 & 3: ANTONIO PARKWAY WIDENING (Work order: ER08990)	\$22,415,679	\$19,272,300	-14.0%	8	ORANGE CO-CLERK OF BOARD OF SUPERVISORS
33	11/29/2011	CADOT OVERHEAD WIDEN UNDERCROSSING & WIDEN ROADWAY: Replace overhead, widen undercrossing and widen roadway (Contract #: 10-481004)	\$22,700,000	\$21,950,178	-3.3%	5	CA-DOT
34	11/16/2011	CADOT HIGHWAY GRADING PAVING & BRIDGE: Realign Highway and Construct Undercrossings (Contract #: 10-340424)	\$22,800,000	\$22,914,260	0.5%	5	CA-DOT
35	6/7/2011	LIVERMORE EL CHARRO INFRASTRUCTURE PHASE 1: El Charro Specific Plan Infrastructure Project-Phase 1 (Contract #: 2007-20)	\$24,178,700	\$19,749,369	-18.3%	7	LIVERMORE-CITY CLERK

36	9/22/2011	CADOT WIDEN NB ROUTE 57 & BRIDGES: Widen NB Route 57 and bridges between Katella Ave and Lincoln Ave (Contract #: 12-0F0404)	\$24,900,000	\$16,391,217	-34.2%	10	CA-TRANSPORTATION PROCUREMENT & CONTRACT
37	11/6/2011	Sorrento to Miramar Double Track, Phase 1 (Contract #: 5001827)	\$27,325,000	\$24,747,777	-9.4%	6	SAN DIEGO-ASSOCIATION OF GOVERNMENTS
38	4/26/2011	CADOT HOV LANES & WIDEN BRIDGE: CONSTRUCT HOV LANES AND WIDEN BRIDGE (Contract #: 04-264064)	\$31,000,000	\$24,280,253	-21.7%	5	CA-DOT
39*	7/19/2011	CALIFORNIA I 405 SOUNDWALL & I 605 BRIDGE WIDENING: I-405 Soundwall And Bridge Widening (Pkg 6) and I-605 Soundwall And Bridge Widening (Pkg 8) (Contract #: C0973)	\$32,640,000	\$16,178,230	-50.4%	8	LOS ANGELES CO-MTA
40	5/24/2011	PLACENTA AVENUE GRADE SEPARATION RAILROAD CROSSING: Placentia Avenue Railroad Grade Separation Project (Contract #: 0-1421)	\$34,192,954	\$23,769,540	-30.5%	8	ORANGE CO-TRANSPORTATION AUTHORITY
41*	8/15/2011	LOS ANGELES CO I 405 & SR 134 SOUNDWALL & BRIDGE WIDENING: I-405 Soundwall And Bridge Widening (Pkg 5) and SR-134 Soundwall And Bridge Widening (Pkg 7) (Contract: C0983)	\$43,030,000	\$18,973,000	-55.9%		LOS ANGELES CO-MTA
42	9/8/2011	CADOT ROADWAY & BRIDGES: Widen roadway and bridges with PCC and construct retaining walls (Contract #: 07-2332A4)	\$50,000,000	\$43,093,711	-13.8%	5	CA-TRANSPORTATION PROCUREMENT & CONTRACT

43	4/14/2011	CADOT VARIOUS FREEWAY BRIDGES & SOUNDWALL: WIDEN FREEWAY, WIDEN 3 BRIDGES, BUILD 1 RETAINING WALL AND 8 SOUNDWALLS (Contract #: 12-0G3304)	\$56,000,000	\$50,311,493	-10.2%	8	CA-TRANSPORTATION PROCUREMENT & CONTRACT
44	4/6/2011	CADOT BRIDGES HMA & SOUND WALL: Widen Bridges and Freeway with HMA & PCCP, & Construct Sound Wall (Contract #: 10-0G4704)	\$77,000,000	\$86,309,896	12.1%	7	CA-DOT

**Group 4 (\$80M+)**

45	5/12/2011	FSP CADOT VARIOUS BRIDGE: WIDEN AND REALIGN FREEWAY WITH PCC AND WIDEN CIP PS CONCRETE BRIDGES (Contract #: 07-2159C4)	\$96,400,000	\$86,565,398	-10.2%	5	CA-TRANSPORTATION PROCUREMENT & CONTRACT
46	9/21/2011	SONOMA MARIN AREA RAIL TRANSIT DISTRICT SEGMENT 1 (Referred to as Phase 1) (Contract #: CV-DB-11-001)	\$80,300,000	\$103,000,000	28.3%	9	SONOMA-MARIN AREA RAIL TRANSIT DISTRICT
47	6/15/2011	FSP CADOT PCCP PLACE HMA WIDEN BRIDGES SOUNDWALLS: REPLACE PCCP, PLACE HMA, WIDEN BRIDGES AND CONSTRUCT SOUNDWALLS (Contract #: 03-3797U4)	\$130,000,000	\$88,422,860	-32.0%	8	CA-DOT
48*	9/7/2011	COLTON UNION PACIFIC RAILROAD UPRR FLYOVER: Colton Crossing Rail-to-Rail Grade Separation Project: at BNSF (Contract #: )	\$202,000,000	\$43,417,676	-78.5%	4	COLTON-PUBLIC WORKS & ENGINEERING

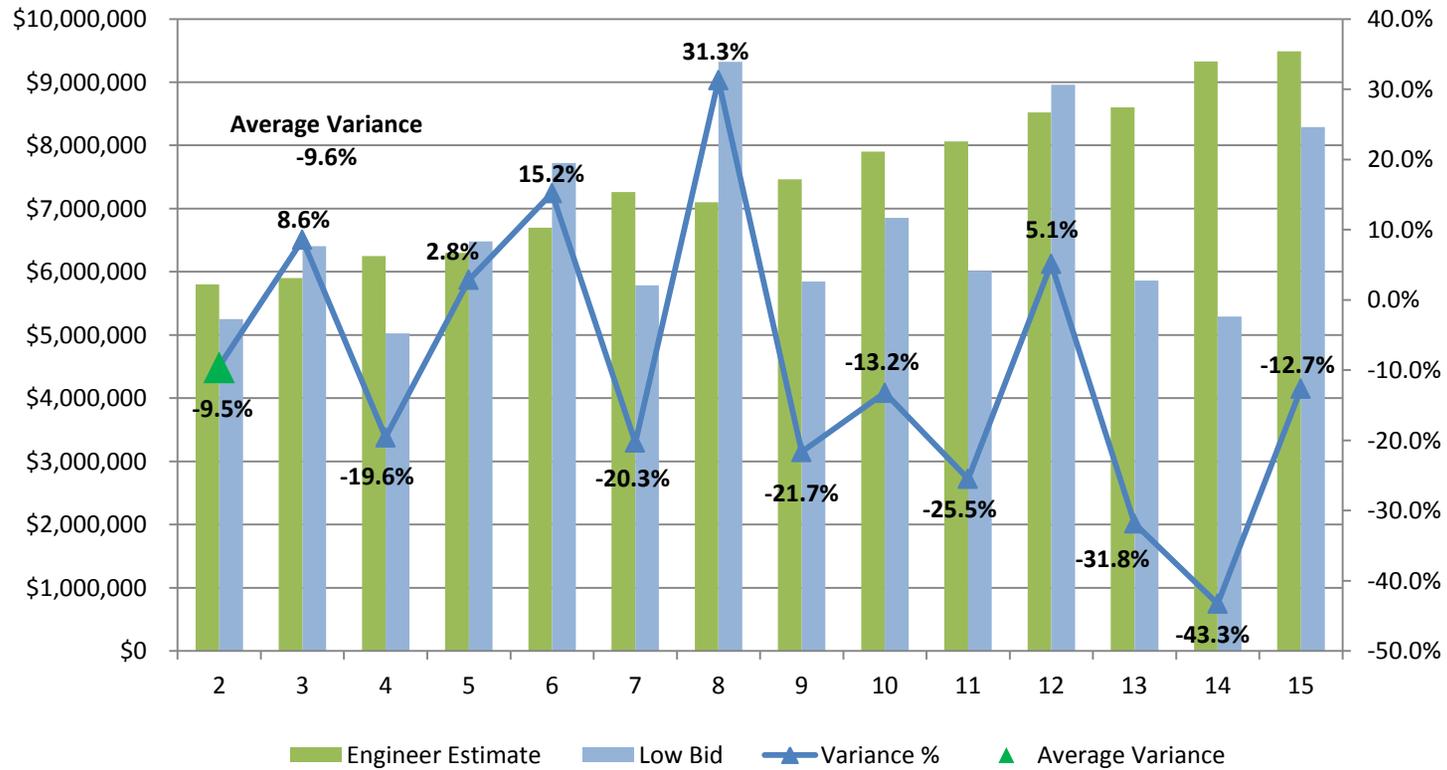
Average Variance

Data chart

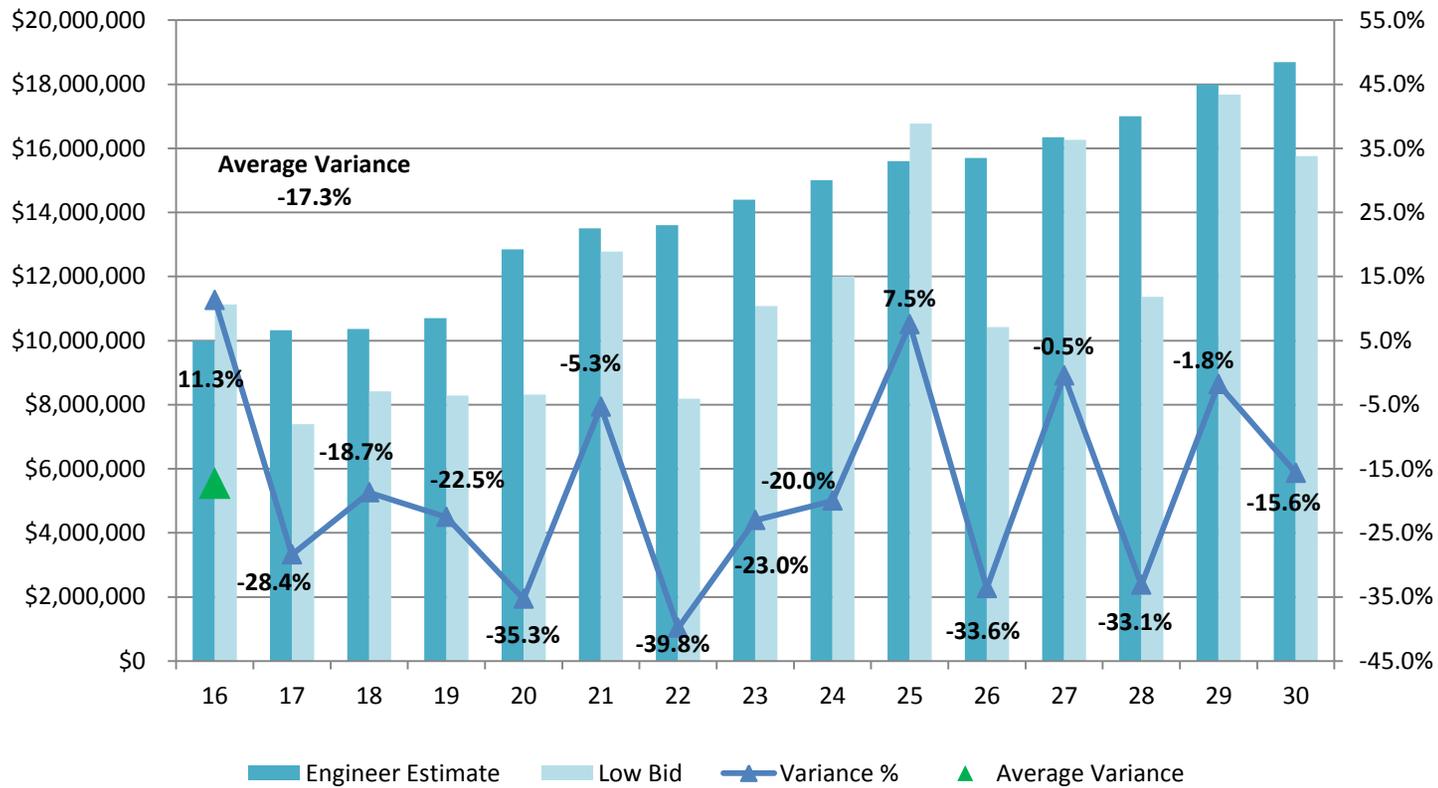
Notes (Items not included in average variance)

-9.6%	2011 Eng Est and Low Bid (Group 1)	1
-17.3%	2011 Eng Est and Low Bid (Group 2)	n/a
-11.2%	2011 Eng Est and Low Bid (Group 3)	39, 41
-4.6%	2011 Eng Est and Low Bid (Group 4)	48

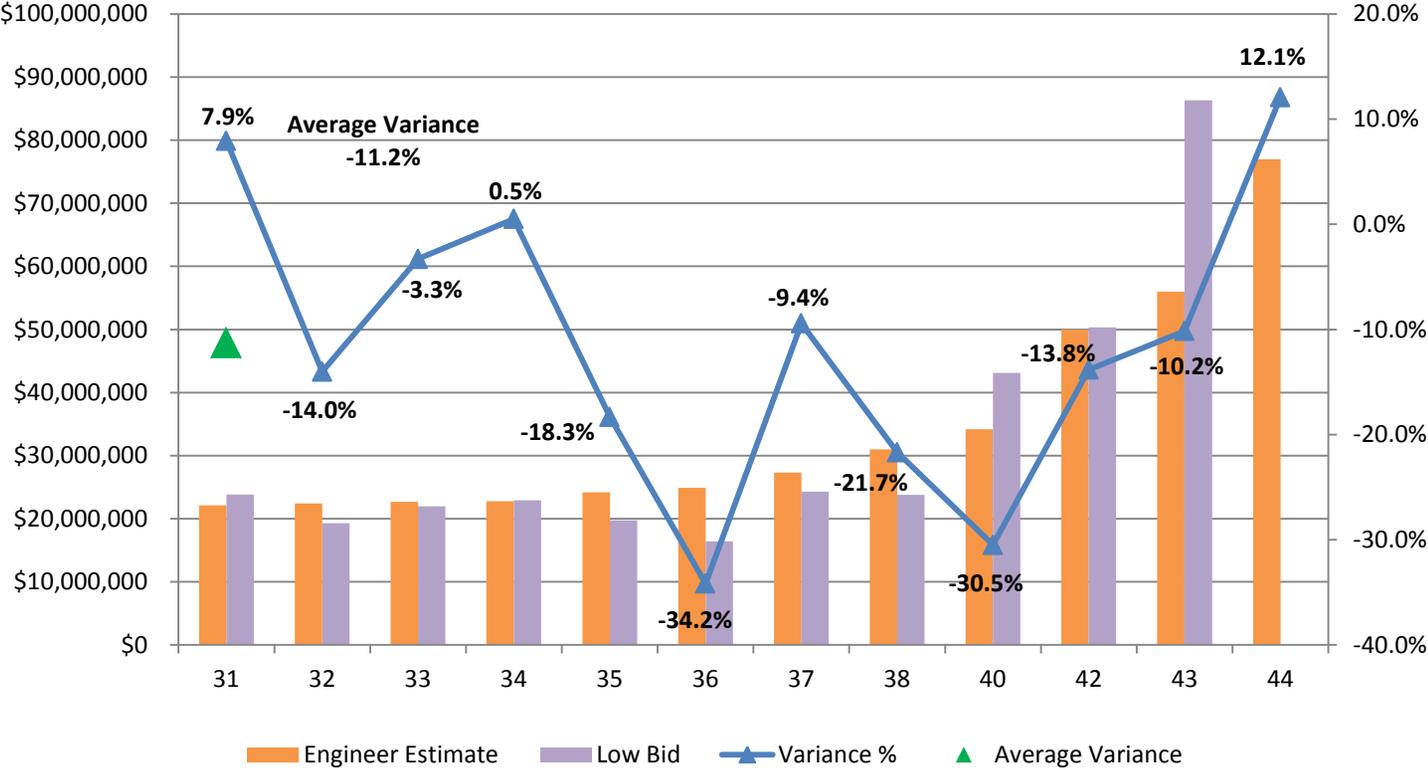
### 2011 Engineer vs Low Bid Variance (Group 1: \$0-10M)



## 2011 Engineer vs Low Bid Variance (Group 2: \$10-20M)



## 2011 Engineer vs Low Bid Variance (Group 3: \$20-80M)



## 2011 Engineer vs Low Bid Variance (Group 4: \$80M+)

