

**Orange County Business Council
Orange County Transportation Infrastructure Construction Cost Pressure Index
Prepared for the Orange County Transportation Authority**

Orange County Business Council Research Team

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Background and Purpose

As a supplementary examination to the recent Next 10: Market Conditions Forecast and Risk Analysis study delivered by Orange County Business Council (OCBC) in September 2017, the Orange County Transportation Authority (OCTA) Board of Directors (Board) requested further study and exploration of potential cost fluctuations beyond existing cost analysis from the California Department of Transportation's (Caltrans) Construction Cost Index (CCI) and internal OCTA analysis. Recent increases in construction costs combined with concerns over sales tax revenue growth trends have necessitated forward looking projections to determine the ability for OCTA to adequately fund a number of transportation and infrastructure projects aimed at alleviating traffic congestion and increasing the quality of life for Orange County residents.

In order to do so, the OCBC team has analyzed annual trends in material costs, labor costs and general economic conditions to determine a range of potential cost increases with a time horizon out until 2020 by collecting tracking relevant market data and indicators and performing data analytics on these datasets. In doing so, and providing these findings to OCTA's Board, more accurate budgets can be determined reducing the potential risk of cost pressure and project delivery slowdowns due to financial constraints. The result of this analysis has been the creation of an Infrastructure CCI which provides a range of potential cost fluctuations for 2018, 2019, and 2020.

Findings

OCBC used a series of regression analyses and forward-looking projections to create the Infrastructure Construction Cost Pressure (ICCP) Index. This ICCP Index provides a ranking from 0-5, with each rank corresponding to a range of percent changes in overall construction costs. The table below highlights each ICCP Index ranking and the proposed range of cost fluctuations, which have been provided on a low, midpoint, and high scale.

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OCBC Orange County Transportation ICCP Index Score Ranking			
Implied Range of Construction Cost Change			
Index Score	Low	Midpoint	High
0	-17%	-9.5%	-2%
1	-2%	-0.5%	1%
2	1%	1.5%	2%
3	2%	4%	6%
4	6%	8.5%	11%
5	11%	25.5%	40%

These ranges are built to be forecasting tools, with scores indicating public construction forecast cost increase. Values of 2 and 3 indicate somewhat normal inflationary environments. A value of 4 is a high inflation environment. A value of 1 is a low inflation/deflationary environment. Values of 0 and 5 correspond to the most extreme conditions observed in Orange County over the past two decades, and hence the ranges for those values are wide due to the unusual nature of the highly deflationary environment that occurred immediately prior to and during the Great Recession and the high cost inflation environment that occurred in the building boom years of the early 2000s.

Using the index scale highlighted above, combined with a detailed trend analysis of building permits, unemployment rates, localized labor costs, material costs and general economic conditions; OCBC estimates an ICCP Index ranking of “4” in 2018, “3” in 2019, and “3” in 2020. This suggests potential cost increases ranging six percent to 11 percent in 2018, two percent to six percent in 2019, and two percent to six percent in 2020.

OCBC Orange County Transportation ICCP Index Score, 2018-2020		
Year	Index Score	Range of Cost Fluctuation
2018	4	6%-11%
2019	3	2%-6%
2020	3	2%-6%

Methodology

To determine the Orange County Transportation ICCP Index, the OCBC team started by aggregating several datasets, measures, and indicators on an annual basis as far back as 1972. Among others, these measures included the Caltrans CCI, state-level building permits and unemployment rates, material costs, and labor costs.

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The OCBC team examined how the various measures and indicators of construction costs varied with changes in (1) building permitting activity, (2) unemployment rates, (3) materials costs, (4) labor costs, and recently past trends in construction inflation. Using statistical analyses, the research team has built a forecasting model that projects forward cost increases, and predicted cost increases, which are grouped into the categorical ranges shown above. OCBC plans to continue to test and refine the cost forecast model, adding information going forward.

Cost Risks - Systematic and Idiosyncratic

Looking forward, we encourage OCTA to think of future cost pressures in two groups – systematic and idiosyncratic risks.

Systematic Cost Risks: These are cost risks that relate to observable and predictable characteristics of the economy and the construction environment. The cost pressure model is built to understand systematic relationships, through statistical modeling, and to use the statistical model to forecast cost pressure in future years. The primary systematic cost pressures are the construction/building environment, the state's economy (which influences both the demand for construction services and the cost of construction labor and materials), and direct measures of material and labor costs. We will continue to refine our measurement of systematic risks.

Idiosyncratic Risks: There are several potential future cost pressures which cannot be statistically modeled. Such cost pressures are not related to historic (and hence observable) economic factors, but rather are, as the name suggests, idiosyncratic. Several such risk factors may be important and warrant careful tracking, even while incorporating these cost pressures into a statistical model is likely not possible. Key idiosyncratic cost risks, at this point, include:

- Tariffs, and associated effects on materials costs, from the nation's changing trade policy.
- Regulatory requirements and changes that create additional hurdles during the bidding process.