



AGENDA

Executive Committee Meeting

Committee Members

Michael Hennessey, Chairman
Lisa A. Bartlett, Vice Chair
Andrew Do
Lori Donchak
Al Murray
Shawn Nelson
Tim Shaw

Orange County Transportation Authority
Headquarters
550 South Main Street
Board Room – Conf. Room 07
Orange, California

Thursday, September 7, 2017 at 9:00 a.m.

Any person with a disability who requires a modification or accommodation in order to participate in this meeting should contact the OCTA Clerk of the Board, telephone (714) 560-5676, no less than two (2) business days prior to this meeting to enable OCTA to make reasonable arrangements to assure accessibility to this meeting.

Agenda descriptions are intended to give members of the public a general summary of items of business to be transacted or discussed. The posting of the recommended actions does not indicate what action will be taken. The Committee may take any action which it deems to be appropriate on the agenda item and is not limited in any way by the notice of the recommended action.

All documents relative to the items referenced in this agenda are available for public inspection at www.octa.net or through the Clerk of the Board's office at the OCTA Headquarters, 600 South Main Street, Orange, California.

Call to Order

Pledge of Allegiance

Director Donchak

1. Public Comments

Special Calendar

There are no Special Calendar matters.



Consent Calendar (Items 2 through 4)

All items on the Consent Calendar are to be approved in one motion unless a Committee Member or a member of the public requests separate action or discussion on a specific item.

2. Approval of Minutes

Approve the minutes of the Executive Committee meeting of August 7, 2017.

3. Measure M2 Quarterly Progress Report for the Period of April 2017 Through June 2017

Tamara Warren/Kia Mortazavi

Overview

Staff has prepared a Measure M2 quarterly progress report for the period of April 2017 through June 2017, for review by the Orange County Transportation Authority Board of Directors. This report highlights progress on Measure M2 projects and programs and will be available to the public via the Orange County Transportation Authority website.

Recommendation

Receive and file as an information item.

4. Measure M2 Performance Assessment Report Update

Tamara Warren/Kia Mortazavi

Overview

Measure M2 includes a requirement for a performance assessment to be conducted every three years to evaluate the efficiency, effectiveness, economy, and program results of the Orange County Transportation Authority in delivering Measure M2. The third of these performance assessments, covering the period of July 1, 2012 through June 30, 2015, was completed and presented to the Board of Directors on August 8, 2016. This report is the final update on the action items from the findings in the performance assessment.

Recommendation

Receive and file as an information item.



Regular Calendar

5. Next 10: Market Conditions Forecast and Risk Analysis

Tamara Warren/Kia Mortazavi

Overview

A Market Conditions Forecast and Risk Analysis has been prepared to inform the Orange County Transportation Authority's Next 10 Plan. The Next 10 Plan provides the framework to accelerate the delivery of Measure M2 freeway, streets and roads, transit, and environmental projects through the year 2026. In response to lower actual sales tax revenue, new forecasting methodology, and increased competition for available resources due to capital work underway in the Southern California Region, a Market Conditions Forecast and Risk Analysis was conducted. The report and findings are presented to the Board of Directors for review.

Recommendations

- A. Receive and file the Next 10 Market Conditions Forecast and Risk Analysis.
- B. Continue to monitor the changing environment and its effects on the advancement of the Next 10 Delivery Plan.
- C. Continue to prioritize Measure M2 projects for external funding consistent with the Orange County Transportation Authority's adopted programming policies.

Discussion Items

6. Chief Executive Officer's Report

7. Committee Members' Reports

8. Closed Session

There are no Closed Session items scheduled.

9. Adjournment

The next regularly scheduled meeting of this Committee will be held at **9:00 a.m. on Monday, October 2, 2017**, at the Orange County Transportation Authority Headquarters, 550 South Main Street, Board Room - Conference Room 07, Orange, California.



MINUTES

Executive Committee Meeting

Committee Members Present

*Michael Hennessey, Chairman
Lisa A. Bartlett, Vice Chair
Andrew Do
Shawn Nelson
Tim Shaw*

Committee Members Absent

*Lori Donchak
Al Murray*

Staff Present

*Darrell Johnson, Chief Executive Officer
Ken Phipps, Deputy Chief Executive Officer
Olga Prado, Assistant Clerk of the Board
Gina Claridge, Board Specialist
James Donich, General Counsel
OCTA Staff and Members of the General Public*

Call to Order

The August 7, 2017 regular meeting of the Executive Committee was called to order by Chairman Hennessey at 9:01 a.m.

Pledge of Allegiance

Director Shaw led in the Pledge of Allegiance.

1. Public Comments

No public comments were received.

Special Calendar

There were no Special Calendar matters.

Consent Calendar (Items 2 and 3)

2. Approval of Minutes

A motion was made by Director Do, seconded by Vice Chair Bartlett, and declared passed by those present, to approve the minutes of the Executive Committee meeting of June 5, 2017.

Director Nelson was not present to vote on this item.



MINUTES

Executive Committee Meeting

3. Proposed Response to Orange County Grand Jury Report on the Ortega Highway Project

A motion was made by Director Do, seconded by Vice Chair Bartlett, and declared passed by those present, to authorize the Chief Executive Officer to submit the proposed response to the Orange County Grand Jury report's findings and recommendations as required by California Penal Code 933(c).

Director Nelson was not present to vote on this item.

Regular Calendar

4. Capital Programs Division – Fourth Quarter Fiscal Year 2016-17 and Planned Fiscal Year 2017-18 Capital Action Plan Performance Metrics

James G. Beil, Executive Director of Capital Programs, reported on the fourth quarter fiscal year 2016-17 and planned fiscal year 2017-18 "Capital Action Plan Performance Metrics." Mr. Beil also referenced Attachment B of the Staff Report.

A discussion ensued regarding:

- SB 1 funding will be influencing and impacting the construction industry.
- The City of Placentia has a consultant updating the Placentia Metrolink Station parking structure design. The Orange County Transportation Authority (OCTA) will consolidate the parking structure design into the station construction package. In addition, the parking structure spaces are sufficient for the transportation needs, and the design is progressing well.
- Construction index indicates cost increases.
- Sales tax projections and construction index are not tracked together; however, staff is monitoring both.

Following the discussion, no action was taken on this receive and file information item.



5. Measure M2 Environmental Mitigation Program Update

Dan Phu, Program Manager, Planning Division, provided a status update on the freeway Measure M2 (M2) Environmental Mitigation Program, and highlighted the major accomplishments and next steps for the mitigation program.

A discussion ensued regarding:

- Vice Chair Bartlett thanked OCTA and the stakeholders for their involvement on the M2 Environmental Oversight Committee (EOC).
- Vice Chair Bartlett also stated that she served on the EOC and experienced first-hand all the major accomplishments.
- Darrell Johnson, Chief Executive Officer (CEO), recognized in the audience and thanked EOC Vice Chair Melanie Schlotterbeck.

Following the discussion, no action was taken on this receive and file information item.

Discussion Items

6. Chief Executive Officer's Report

Darrell Johnson, CEO, reported that:

- OCTA continues to move ahead with the Interstate 5 (I-5) South County Improvements Project. Construction activity will require a weekend closure of the northbound I-5 on- and off-ramps and intermittent closures of Avenida Pico underneath the freeway

The I-5 closures are scheduled to begin as early as 8:00 p.m., on Friday, August 18th and re-open by 5:00 a.m., Monday, August 21st. Motorists will be notified through OCTA's regular channels.

- The OC Fair Express has one more weekend, and this past weekend there were 20,520 boardings for a total of 70,658 boardings for the season. The boardings increased by 38 percent, and the data compares Saturday and Sunday service for this year and last year.
- OCTA's procurement team earned the 2017 Annual Achievement of Excellence in Procurement Award from the National Procurement Institute. This is the 7th consecutive year OCTA has received the award. In addition, OCTA is one of only 45 agencies in California and one of only 24 special districts in the United States and Canada to receive the award.



MINUTES

Executive Committee Meeting

7. Committee Members' Reports

Vice Chair Bartlett referenced Consent Calendar Item 3 on the agenda and asked that the California Department of Transportation work with OCTA and the stakeholders to keep the overall price down for the Ortega Highway project.

Vice Chair Bartlett reported that last week OCTA had successful meetings and a tour of the OC Streetcar corridor with Congressman Mario Diaz-Balart of the 25th Congressional District in Florida. Vice Chair Bartlett also thanked OCTA staff and Director Nelson for participating in the meetings with Congressman Diaz-Balart.

Vice Chair Bartlett also reported that the Laguna Beach Summer Breeze shuttle's second year has been very successful.

8. Closed Session

There were no Closed Session items scheduled.

9. Adjournment

The Executive Committee meeting adjourned at 9:37 a.m.

The next regularly scheduled meeting of this Committee will be held at **9:00 a.m. on Thursday, September 7, 2017**, at the Orange County Transportation Authority Headquarters, 550 South Main Street, Board Room – Conference Room 07, Orange, California.

ATTEST

Olga Prado
Assistant Clerk of the Board

Michael Hennessey
Chairman



September 7, 2017

To: Executive Committee

From: Darrell Johnson, Chief Executive Officer 

Subject: Measure M2 Quarterly Progress Report for the Period of April 2017 Through June 2017

Overview

Staff has prepared a Measure M2 quarterly progress report for the period of April 2017 through June 2017, for review by the Orange County Transportation Authority Board of Directors. This report highlights progress on Measure M2 projects and programs and will be available to the public via the Orange County Transportation Authority website.

Recommendation

Receive and file as an information item.

Background

On November 7, 2006, Orange County voters, by a margin of 69.7 percent, approved the Renewed Measure M Transportation Investment Plan (Plan) for the Measure M2 (M2) one half-cent sales tax for transportation improvements. The Plan provides a 30-year revenue stream for a broad range of transportation and environmental improvements, as well as a governing ordinance which defines all the requirements for implementing the Plan. Ordinance No. 3 designates the Orange County Transportation Authority (OCTA) as responsible for administering the Plan and ensuring that OCTA's contract with the voters is followed.

OCTA is committed to fulfilling the promises made in M2. This means not only completing the projects described in the Plan, but adhering to numerous specific requirements and high standards of quality called for in the measure, as identified in the ordinance. Ordinance No. 3 requires that quarterly status reports regarding the major projects detailed in the Plan be brought to the OCTA Board of Directors (Board). All M2 progress reports are posted online for public review.

Discussion

This quarterly report reflects current activities and progress across all M2 programs for the period of April 1, 2017 through June 30, 2017 (Attachment A).

The quarterly report is designed to be easy to navigate and user friendly, reflecting OCTA's Strategic Plan transparency goals. The report includes budget and schedule information included in the Capital Action Plan, Local Fair Share Program, and Senior Mobility Program payments made to cities this quarter, as well as total distributions from M2 inception through June 2017.

Additionally, Attachment A includes a summary of the Program Management Office activities that have taken place during the quarter. Two areas in particular are highlighted below.

Next 10 Delivery Plan

On November 14, 2016, the Board adopted the Next 10 Delivery Plan, which provides guidance to staff on delivery of M2 projects and programs between 2017 and 2026. During the Next 10 time period, more than \$6 billion in transportation improvements promised to the voters in M2 are to be completed or underway by 2026. Pages three through six of Attachment A (in every M2 quarterly report) include OCTA's progress on delivering the ten objectives identified in the Next 10 Plan. In summary, all ten objectives are moving forward toward delivery as adopted by the Board.

Also part of the Next 10 Plan adoption, the Board directed staff to conduct a market analysis to analyze current resource demands and provide information on the impact on OCTA's delivery of M2 projects. Staff will receive a draft report in August 2017, and results of the analysis will be presented to the Board next quarter.

Next 10 Sales Tax Forecast Update

OCTA is currently receiving presentations from our contracted agencies who provide an annual Orange County sales tax forecast update. During the quarter, MuniServices and the University of California, Los Angeles presented updates on the annual forecast and economic outlook to the Finance and Administration Committee. To date, sales tax revenues appear to be lower than was forecasted last year when the Next 10 Plan was adopted. Once all presentations are complete and the fourth quarter sales tax actuals are finalized, an updated forecast will be provided to the Board. This will likely require a Next 10 Plan update which will be brought to the Board for consideration in the fall.

Progress Update

The following highlights M2 Program accomplishments that occurred during the fourth quarter:

- Final design plans for Interstate 5 (I-5) between State Route 55 (SR-55) and State Route 57 were completed, and the California Department of Transportation (Caltrans) is preparing the bid package to list. (Project A)
- The 95 percent design plans for I-5 between State Route 73 (SR-73) and Oso Parkway/Avery Parkway interchange were submitted to Caltrans on June 14, 2017. Staff expects to submit funding documents to Caltrans in July 2017. (Project C and Project D)
- Construction activities on I-5 between Avenida Vista Hermosa and Pacific Coast Highway are wrapping up. While construction is scheduled to be complete by the end of July 2017, the added carpool lanes will open in early 2018, after project segments on either side are complete. (Project C and Project D)
- Environmental work began in May 2017 for the I-5, El Toro Road Interchange. (Project D)
- The supplemental draft project report and environmental document for the SR-55 between Interstate 405 (I-405) and I-5 was completed and circulated for public review and comment. A public hearing took place on April 20, 2017. On June 12th, the Board executed a cooperative agreement with Caltrans and issued a request for proposals for the design phase. (Project F)
- On June 26, the Board approved the Transportation Infrastructure Finance and Innovation Act (TIFIA) loan agreement between OCTA and the United States Department of Transportation (USDOT) for the I-405 Improvement Project between SR-73 and Interstate 605. On June 29, the USDOT Build America Bureau, Federal Credit Council on Finance recommended the TIFIA loan for approval by the Secretary of Transportation. (Project K)
- On April 10, 2017, the Board approved funding for 13 Regional Capacity projects, in an amount totaling \$32.24 million, and approved funding for five Regional Traffic Signal Synchronization projects, totaling \$2.5 million. (Project P)

- The Lakeview Avenue Grade Separation Project was opened to motorists on June 5, 2017. (Project O)
- The Board awarded the construction contract on June 12, 2017, for the Orange Metrolink Station Parking Structure. (Project R)
- Design plans for the Placentia Station have been completed at 90 percent and are being reviewed. A contract for construction management services is expected to be in place by August 2017, so a required constructability review can occur. (Project R)
- Based on a Risk Workshop, and recommendations by the Federal Transit Administration (FTA) for the OC Streetcar, an updated cost estimate and funding plan were presented to and approved by the Board on May 22, 2017. The funding request, as well as extensive project readiness documents required for the application, were submitted to FTA in late May 2017. (Project S)
- On June 19, 2017, the United States Fish and Wildlife Service and the California Department of Fish and Wildlife finalized the issuance of their respective biological opinion, findings, and associated permits, as well as signed the OCTA M2 Natural Community Conservation Plan/Habitat Conservation Plan Implementing Agreement. This significant milestone was achieved following years of collaboration. (Environmental Mitigation Program)
- The Taxpayer Oversight Committee unanimously found that OCTA is proceeding in accordance with the M2 Transportation Ordinance and Investment Plan, and that Measure M is being delivered as promised to voters for the 26th consecutive year.

Caltrans and OCTA continue to work together to move projects forward. Looking ahead, Caltrans' strategic policy direction now includes a focus on enhancements of high-occupancy vehicle lanes. This policy shift needs to be closely coordinated with the remaining M2 freeway projects. OCTA continues to advise Caltrans that new state policies need to take voter commitments into consideration and be implemented as additive projects to M2 improvements where appropriate.

Another challenge that the program has faced is the delay in previously programmed M2 projects. With the passage of the state transportation funding bill, SB 1 (Chapter 5, Statutes of 2017), staff is working with the California Transportation Commission (CTC) to bring funding for M2 projects back to the original schedule and also to understand how M2 projects and programs may benefit from SB 1.

Staff is currently preparing the 2018 State Transportation Improvement Program (STIP) application to the CTC. First priority of all funding sources is to fulfill commitments to M2/Next 10 projects, and to maintain OCTA's existing assets in a state of good repair. Consideration will also be given to use state and federal funds for projects that are complementary to M2 projects. The 2018 STIP funding application will be brought to the Board in September.

A critical factor in delivering M2 freeway projects is to ensure project scope, schedules, and budgets remain on target. Project scope increases, schedule delays, and resulting cost increases can quickly affect project delivery and have a cascading effect on other activities. In light of the recent reduction in the sales tax revenue forecast, this factor is even more significant.

To address this issue, staff worked with our regional partners and gained support from the Director of Caltrans, Malcolm Dougherty, in the creation of a master agreement between regional transportation planning agencies (OCTA) and Caltrans. The master agreement is intended to acknowledge the importance and commitment by both agencies to the delivery of local measure projects focusing on maintaining budget and schedule. Development of the agreement is under way, and staff will report on the progress next quarter.

Project delivery is monitored closely, and progress, as well as challenges, are presented to the Board through these quarterly staff reports, individual project staff reports, as well as through the Capital Action Plan quarterly performance metrics reports from the Capital Programs Division.

Summary

As required by the M2 Ordinance No. 3, a quarterly report covering activities from April 2017 through June 2017 is provided to update progress in implementing the Plan. The above information and the attached details indicate significant progress on the overall M2 Program. To be cost-effective and to facilitate accessibility and transparency of information available to stakeholders and the public, the M2 quarterly progress report is presented on the OCTA website. Hard copies are available by mail upon request.

Attachment

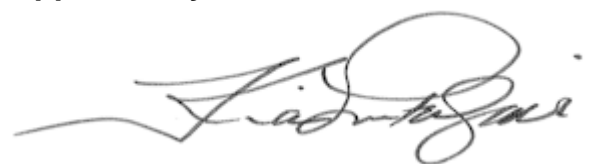
- A. Measure M2 Progress Report – Fourth Quarter of Fiscal Year 2016-17 – April 1, 2017 through June 30, 2017

Prepared by:



Tamara Warren
Manager, Program Management Office
(714) 560-5590

Approved by:



Kia Mortazavi
Executive Director, Planning
(714) 560-5741



Wildlife Agencies issued the biological permits and signed the Conservation Plan Implementing Agreement for the freeway projects.

FOURTH QUARTER HIGHLIGHTS:

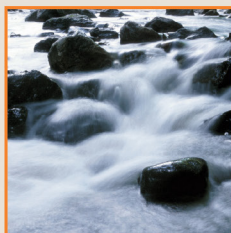
- Freeway Projects
- Streets and Roads
- Environmental Cleanup & Water Quality
- Freeway Mitigation Program
- Finance Matters
- Program Management Office
- Summary

Measure M2

Progress Report



Fourth Quarter of Fiscal Year 2016-17
April 1, 2017 through June 30, 2017



Measure M2

Progress Report



SUMMARY

As required by the Measure M2 (M2) Ordinance No. 3, a quarterly report covering activities from **April 1, 2017 through June 30, 2017** is provided to update progress in implementing the M2 Transportation Investment Plan.

To be cost effective and to facilitate accessibility and transparency of information available to stakeholders and the public, the M2 progress report is presented on the Orange County Transportation Authority (OCTA) website. Hard copies are mailed upon request.

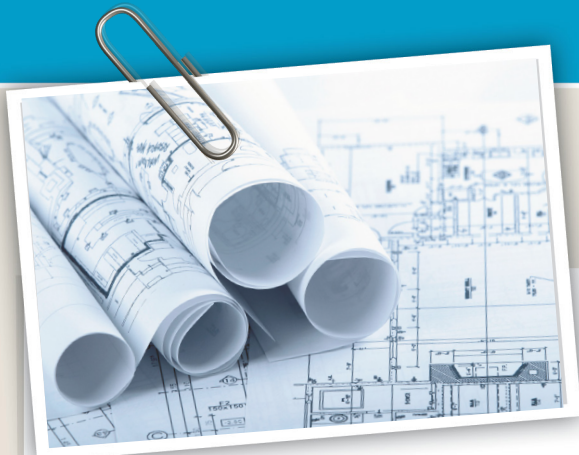


Cover photo shown is the cake created to celebrate with the environmental community a major milestone for the Freeway Program. On June 19, 2017, the Wildlife Agencies issued the biological permits and signed the Conservation Plan Implementing Agreement. Receipt of these permits represent the culmination of years of collaboration.

Measure M2

Progress Report

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Measure M2

Progress Report



M2 Project Schedules



Conceptual



Environmental



Design, Advertise, &
Award



Design-Build

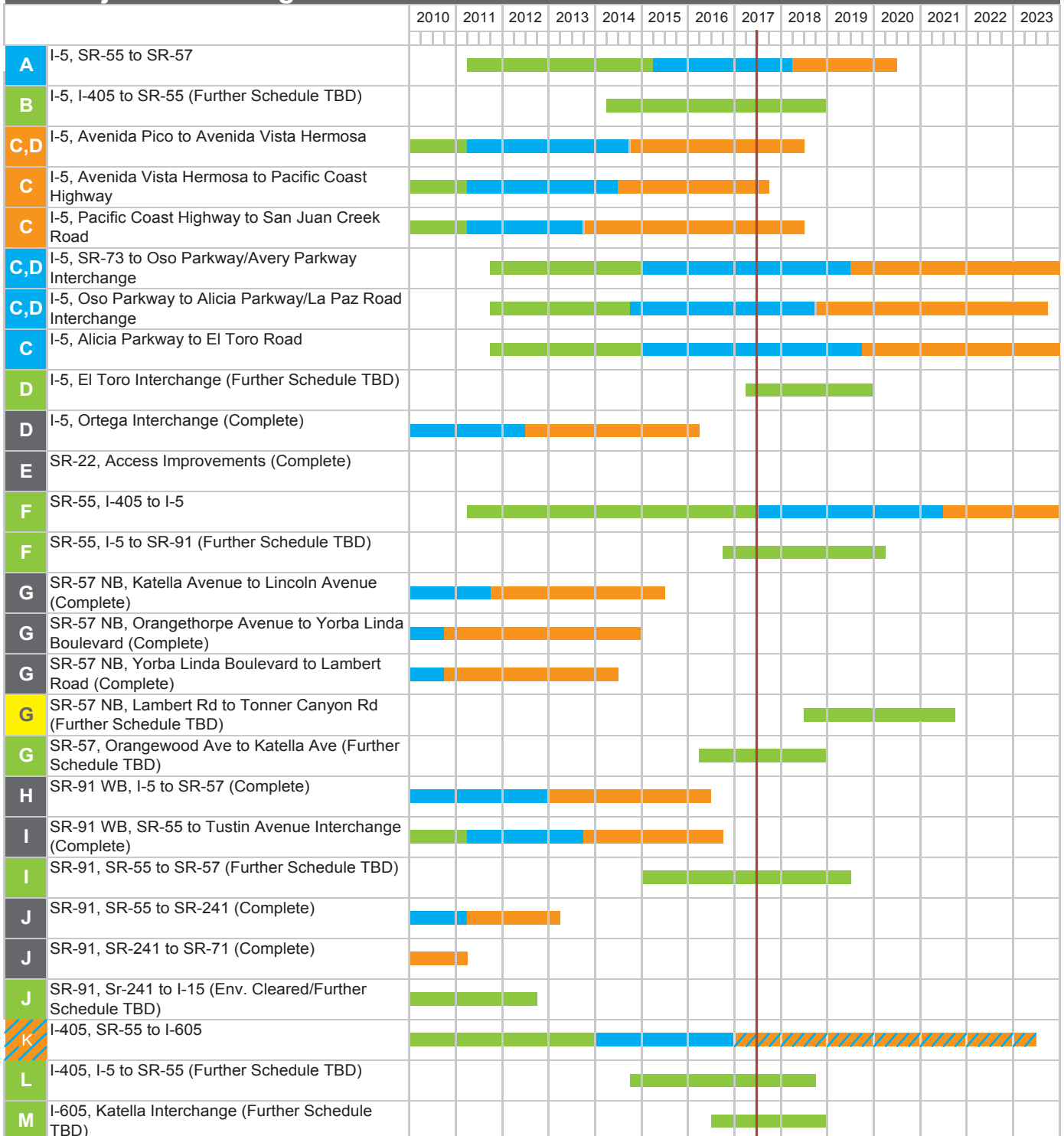


Construction



Completed

M2 Projects and Programs



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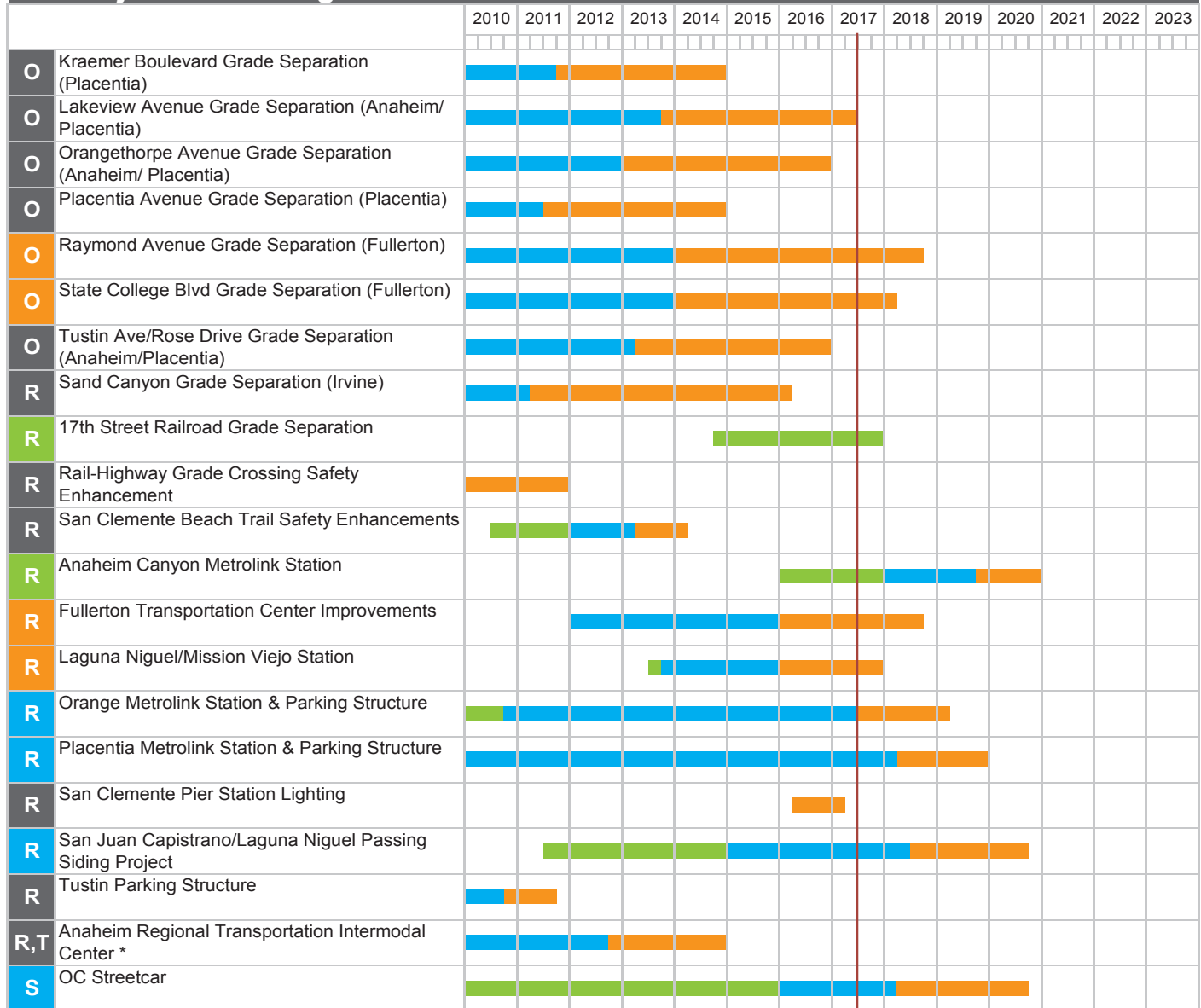
Measure M2

Progress Report



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M2 Projects and Programs



*Projects managed by local agencies.

Project K is a Design-Build project, with some overlap in activities during phases. Phase work can be concurrent.

Shown schedules are subject to change.

Measure M2

Progress Report

M2 DELIVERY RISK UPDATE



Key:

- One to Watch
- At Risk

M2 Delivery Risk Update

This section discusses the risks and challenges related to overall Measure M2 and Next 10 Plan delivery that the Measure M Program Management Office is watching – complete with associated explanations and proposed actions. The below risks have been identified in the Board-adopted Next 10 Delivery Plan.

Delivery Risk	Explanation	Proposed Action
Financial		
1	Continuation of a lower-than-projected M2 revenue forecast or a reduction in external revenue assumptions would impact delivery.	<p>The original 2005 projection was \$24.3 billion. The Next 10 Plan is based on the 2016 Board-adopted forecast of \$14.2 billion which has a significant reliance on external funding. The data collection for the 2017 revenue forecast is underway.</p> <p>Continue to actively pursue all available state and federal revenue including Senate Bill 1 (SB 1) funding.</p> <p>Staff is currently reviewing the Next 10 Plan to include updated revenue and costs. A Board update is planned in fall 2017.</p>
2	The inability to scale the Freeway Program to available revenue with large freeway capital projects moving forward in the Next 10 timeframe.	<p>Management of project scopes and schedules is key to the successful delivery of the overall Freeway Program. Given the magnitude of upcoming projects (e.g. Project K), scope changes and any length of delay with associated cost escalation can be impactful and will need to be tightly managed.</p> <p>Staff will work closely with project managers and Caltrans to seek cost-saving measures on freeway projects through changes in design parameters where possible.</p> <p>Tight monitoring of project schedules and scopes will be required to ensure delivery of the entire Freeway Program. OCTA and other neighboring self-help counties are working with Caltrans to create a Master Agreement stating the importance of local project delivery and delivery schedules.</p>
3	Rising cost of operating Metrolink train service.	<p>Operational cost of Metrolink service continues to grow as new regulations are imposed, such as Positive Train Control, track-sharing arrangements with Burlington Northern Santa Fe, and new locomotive requirements.</p> <p>The passage of SB 1 provides a small source of additional revenues to help fund Metrolink Operations. In addition, Project R revenues will be reevaluated as part of the Next 10 Plan Update. Staff will continue to work closely with Metrolink and our partners to ensure cost increases are minimized while service is optimized.</p>
4	Timeframe for establishment of an endowment fund for long-term management of seven conservation properties (Preserves), as part of the Freeway Environmental Mitigation Program (EMP), may be extended.	<p>A portion of the annual revenues for the EMP will be dedicated to the endowment deposits. If sales tax revenues continue to decline, it may take longer to establish the endowment.</p> <p>Staff will continue to engage state and federal resource agencies to minimize management costs for the Preserves. Timing for the establishment of the endowment in the prescribed ten-to-twelve year period will be reevaluated as part of the Next 10 Plan Update. The first deposit of \$2.9 million to the endowment was made in March 2017.</p>

Measure M2

Progress Report

M2 DELIVERY RISK UPDATE



Continued from previous page...

Delivery Risk		Explanation	Proposed Action
Organizational			
5	Availability of specialized staff, given the scope of Right-of-Way (ROW) activities for various freeway construction activities.	Timely ROW acquisition and utility clearance has proven to be a key factor in reducing risk on construction projects. Early acquisition is challenged by the heavy demand on Caltrans' ROW resources. This is further challenged by a change in meeting frequency by the California Transportation Commission, a necessary step in ROW settlement.	Expert and timely coordination between OCTA and Caltrans is imperative to manage this risk. Staff is currently working with Caltrans to ensure ROW resource needs are met through determining project lead responsibility for projects as they move forward. If resource issues become a problem, OCTA could consider taking full responsibility for ROW activities.
6	New operational responsibilities with both the I-405 Express Lanes and OC Streetcar	With the implementation of both the I-405 Express Lanes and the OC Streetcar service, OCTA will be increasing its overall role in operations.	OCTA holds a strong track record in operating various transportation systems including the 91 Express Lanes and both a fixed and demand-based bus network. Additionally, OCTA will look to augment staff's capabilities to provide guidance for operating the OC Streetcar.
Policy			
7	New statewide directives creating additional hurdles for the Freeway Program in particular.	<p>With new statewide directives focused on greenhouse gas reductions, it will be more difficult to environmentally clear the remaining M2 general purpose lane projects.</p> <p>Additionally, within the recently completed Caltrans managed lanes study, inclusion of managed lanes is suggested for M2 project corridors where the promise to the voters is the addition of a general purpose lane. Projects currently in the environmental phase are potentially at risk.</p>	<p>OCTA will need to ensure that when freeway improvement projects are reviewed for environmental clearance, they are viewed as part of a larger suite of transportation improvements.</p> <p>OCTA staff will work closely with Caltrans to emphasize the importance of keeping the promise to the voters.</p>
Market			
8	Major capital work underway in the Southern California region impacting OCTA's ability to secure resources needed for project and program delivery.	Competition for available resources for capital projects in the Southern California region has increased with the major capital work currently underway in Riverside, Los Angeles, and San Diego County. For future projects going forward, engineers, ROW experts, and materials will be in higher demand.	A market research analysis is currently underway. The analysis will evaluate staffing and resource needs to implement the Next 10 Plan and help guide OCTA in navigating the bidding environment. Any recommendations, as a result of the analysis, requiring modifications to the delivery plan will be brought to the Board for action.



Next 10 Plan Update

Contact: Tami Warren, PMO Manager
(714) 560-5590

On November 14, 2016, the Board of Directors (Board) approved the Next 10 Delivery Plan, a ten-year plan that outlines projects and programs for all modes of transportation to be delivered on an expedited schedule between 2017 and the year 2026. The plan identified ten deliverables for what is to be accomplished, with the overarching goal of successfully delivering the M2 Program by 2041 as promised.

Next 10 revenue, expense, and schedule sequencing assumptions have been incorporated into the M2 cash flow model. Tight monitoring of cash flow assumptions versus actual revenue, expense, and schedule activity is underway using a tracking mechanism created for this purpose. This quarter, OCTA's contracted forecasting agencies began providing their 2017 Measure M2 30-year economic outlook for taxable sales presentations. Presentations to the Finance Committee by each agency are scheduled to conclude in August. While final sales tax receipts for FY 2016-17 have not been received, the forecasting agencies' economic outlook provided to date, indicate further decline in sales tax collections. Staff is currently reviewing the Next 10 Plan and preparing an update planned to go to the Board in the fall of 2017.

Next 10 Plan Deliverables

1. Deliver \$3 billion of freeway improvements promised in M2020 (Projects A-M).

The M2 freeway program currently consists of 27 projects or project segments. At the point of Next 10 adoption, nine were already complete, and another nine designated to be complete within the Next 10 time-frame. Together, the nine segments designated for completion make up the \$3 billion delivery promise. Segments to be complete by 2026 include: three segments of I-5 between Avenida Pico and San Juan Creek Road (Project C) which are currently in construction, one project on I-405 between SR-55 and I-605 (Project K) in the Design-Build phase, another four segments on I-5 (one between SR-55 and SR-57 and the other three between SR-73 and El Toro Road) that are in design, and one segment on SR-55 (between I-405 and I-5) that is in the environmental phase. For more details, see previous page (Project Schedules) and the project updates contained in the following pages.

2. Invest approximately \$1.2 billion more in revenues, bringing the completed Freeway Program improvements to \$4.2 billion (Projects A-M).

The final nine remaining project segments (of the 27 total) are on track to be environmentally cleared by 2020, making them "shelf ready" for future advancement as revenues become available. The Next 10 Plan designated another \$1.2 billion (in addition to the \$3 billion promised above) toward moving one or two projects from the nine into construction by 2026. Congestion levels, readiness, and cost risk are factors that will determine which environmentally cleared projects will be recommended to the Board to advance into the construction phase. Project I (between SR-55 and SR-57) meets the above criteria and was designated as a priority project by the Board in the

Continued from previous page...

Next 10 Plan.

3. Allocate \$1 billion, with \$400 million in competitive funding to local jurisdictions to expand roadway capacity and synchronize signals (Project O and P) and \$630 million in flexible funding to local jurisdictions to help maintain aging streets or for use on other transportation needs, as appropriate (Project Q).

Since M2 inception, OCTA invested approximately \$263 million in M2 funds into the Regional Capacity Program (Project O), \$72.5 million in Regional Traffic Signal Synchronization Program (Project P), and \$288.5 million in the Local Fair Share Program (Project Q). Since the adoption of the Next 10 Plan, a total of \$44.3 million in Local Fair Share funds have been distributed to local agencies. Final funding recommendations for the 2017 Project O and P call for projects were presented to the Board on April 10, 2017.

a. Complete the remaining three grade separation projects (Project O).

When the Next 10 was adopted, grade separation projects under construction included: Raymond Avenue, State College Boulevard, and Lakeview Avenue. Lakeview Avenue grade separation was completed in June 2017. Construction on Raymond and State College is expected to be complete in summer 2018. To date, the Board has approved \$664 million in committed M2 and external funds for all seven of the OC Bridges Program grade separation projects.

4. Expand Metrolink service between Orange County and Los Angeles County, contingent upon cooperation and funding participation from route partners; complete six rail station improvements (Project R).

The Riverside County Transportation Commission (RCTC), Los Angeles County Metropolitan Transportation Authority (Metro), and OCTA continue to work together to secure approval of a Memorandum of Understanding (MOU) with Burlington Northern Santa Fe (BNSF) Railway, which is necessary to operate train service on BNSF-owned tracks. Metrolink is the lead in the discussions with the BNSF Railway to evaluate the current shared use and indemnification/liability agreements that govern the use of each agency's respective railroad rights of way. Special counsel has been brought in to assist in these discussions.

Within this program, funding is provided for rail corridor and station improvements to accommodate increased train service and commuter use - including station upgrades, parking expansions, and safety enhancements. The Next 10 Plan identifies six projects to be completed by 2026, which include: Laguna Niguel/Mission Viejo Metrolink station Americans with Disabilities Act (ADA) ramps (construction 78% complete), Orange Metrolink station parking structure (construction to begin July 2017), Placentia Metrolink station (construction to begin spring 2018), Anaheim Canyon Metrolink station improvement project (construction to begin late 2019), Fullerton Transportation Center elevators (construction 5% complete), and San Clemente Pier Metrolink/Amtrak station lighting (completed March 2017). For more details, see the project updates contained in the following pages.

5. Complete design, construction and begin operating the OC Streetcar (Project S) and complete the Orange County Transit Vision and the Harbor Corridor Transit Study to guide development of future transit connections (Project S).

OC Streetcar

To date, the Board has approved up to \$306.4 million for the OC Streetcar project, including preliminary studies, environmental, project development and construction. The Federal Transit Administration (FTA) has shown strong

Continued from previous page...

support for this project, as show by ascribing an overall medium-high rating to it in their Fiscal Year 2018 Annual New Starts Report. The full Notice to Proceed for design was issued in February 2016. Approval for entry into the New Starts Engineering phase was obtained from the FTA in January 2017. On May 22, 2017, the Board directed staff to enter into a Full Funding Grant Agreement with the FTA for the OC Streetcar project.

OC Transit Vision

During this quarter the Transit Investment Framework was completed. This document will be used through the remaining steps of the Transit Master Plan process to develop and evaluate recommendations. Also in this quarter, a “Build Your Own System” survey was used to solicit investment priorities from the public and stakeholders. In the next quarter, the project will focus on developing “Transit Opportunity Corridors” and recommendations for short-term bus route changes. Completed project documents can be downloaded from the project website at www.octa.net/octransitvision. The complete OC Transit Vision Plan is expected to be presented to the Board in November 2017.

Harbor Corridor Transit Study

During the quarter, the Harbor Study team completed outreach activities on the draft alternatives and began the final study phase, the evaluation of alternatives. On April 5th the team held the second and final open house and on April 16th the team provided an update to the Santa Ana City Council. The project development team (PDT) held monthly coordination meetings in April and May to finalize the definition of alternatives and discuss the modeling assumptions. In order to provide additional time to finish the model runs, complete the alternatives evaluation, and prepare the draft final report, the schedule for the OCTA Board update was moved from July to September 2017, and the June PDT meeting was rescheduled to August.

6. Provide up to \$120 million in funding to expand mobility choices for seniors and persons with disabilities (Project U).

Since M2 inception, more than \$48 million in Project U funds has been provided for the Senior Mobility Program (SMP), the Senior Non-emergency Medical Transportation Program (SNEMT), and the Fare Stabilization Program. Included in this amount, approximately \$8.4 million has been provided for the SMP, SNEMT, and Fare Stabilization programs since the Next 10 Plan adoption.

7. Support local agency efforts to deliver Board-approved community transit projects and provide grant opportunities for local agencies to implement effective local transit services (Project V).

Since 2013, the Board has approved approximately \$36.86 million to fund 29 community-based transit service projects (22 capital and operations grants and 7 planning grants). Approved projects service areas in 19 cities and the County of Orange: Anaheim, Costa Mesa, County of Orange, Dana Point, Fountain Valley, Garden Grove, Huntington Beach, Irvine, La Habra, Laguna Beach, Laguna Niguel, Lake Forest, Mission Viejo, Newport Beach, Placentia, Rancho Santa Margarita, San Clemente, San Juan Capistrano, Tustin, and Westminster. OCTA receives ridership reports from local agencies on a regular basis to monitor the success of these services against performance measures adopted by the Board. Staff continuously monitors these services to ensure the performance standards are met and provide reports to the Board on a regular basis. Projects that don’t meet the standards are brought before the Board with recommendations that include discontinuing service. For more details on program performance and service see page 30.

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8. Allocate \$9 million in funding to improve the top 100 busiest bus stops in Orange County and support the modernization of the bus system to enhance the customer experience (Project W).

Between M2 inception and Next 10 Plan adoption, the Board approved up to \$1,205,666 for supporting 51 city-initiated improvements and \$370,000 for OCTA-initiated improvements. The City of Anaheim postponed development of eight stops and will move forward in a future funding cycle. Of the remaining 43 stops, 10 stops have been completed to date and the remainder are underway. The \$370,000 contribution was invested towards a mobile ticketing application to make it more convenient for bus customers to purchase bus passes, obtain trip information, and board buses by enabling riders to use smart phone devices to display bus passes as proof of payment. Following implementation of the existing projects, staff will work with local agencies to assess future funding needs. Future funding recommendations will be brought to the Board.

9. Ensure the ongoing preservation of purchased open space (Preserves), providing comprehensive mitigation of the environmental impacts of freeway improvements and higher-value environmental benefits in exchange for streamlined project approvals (Projects A-M).

The Freeway Mitigation Program is proceeding as planned, with seven properties (Preserves) acquired (1,300 acres), and 12 restoration projects approved for funding by the Board, totaling approximately 350 acres. These Preserves and restoration projects are folded into the OCTA Natural Community Conservation Plan/Habitat Conservation Plan (Conservation Plan), which contributes mitigation to streamline the permitting process for M2 freeway projects. The program's Conservation Plan and Final Environmental Impact Report and Environmental Impact Statement (EIR/ EIS) were approved by the Board in November 2016. The final permits were approved by the Wildlife Agencies in June 2017. As part of the Conservation Plan process, an endowment is required to be established to pay for the long-term management of the Preserves. As anticipated, the first deposit for the endowment was made in early 2017. Staff will continue to oversee and manage the Preserves until a long-term manager(s) is established. Management of the Preserves includes the development and release of Preserve specific resource management plans. Additionally, staff will monitor the progress of all restoration projects and provide status updates to the Environmental Oversight Committee until each project is implemented.

10. Work with the Environmental Cleanup Allocation Committee (ECAC) to develop the next tiers of water quality programs, with a goal of providing \$40 million in grants to prevent the flow of trash, pollutants, and debris into waterways from transportation facilities. In addition, focus on improving water quality on a regional scale that encourages partnerships among the local agencies as part of the Environmental Cleanup Program (Project X).

Prior to Next 10 adoption, the Board awarded approximately \$45 million for 138 Tier 1 and 22 Tier 2 projects. On March 13, 2017, the Board approved the FY 2017-18 Environmental Cleanup Program Tier 1 call for projects, totaling approximately \$3.1 million. The FY 2017-18 Tier 1 recommendations for funding projects to the Board is anticipated in August 2017. Staff is working with the ECAC and the County of Orange to determine the best timing for the next Tier 2 call based on projected cash flow and local jurisdictions' interest in potential viable Tier 2 projects.

Measure M2

Progress Report

FREEWAYS



Interstate 5 (I-5) Projects

Project A

I-5, SR-55 to SR-57

Contact: Rose Casey, Highways
(714) 560-5729

Status: 100% Design complete. Caltrans is preparing the Bid package to be Ready to List for Advertisement, expected in the second quarter of Fiscal Year 2017-18

Summary: This project will increase HOV capacity by adding a second HOV lane in both directions along I-5 between SR-55 and SR-57 in Santa Ana. This quarter, the OCTA consultant submitted the 100 percent final design Plans, Specifications, and Estimates (PS&E). Staff is working with the California Department of Transportation (Caltrans) to obtain Office Engineer Acceptance, expected in July 2017. Due to the STIP funding reduction, staff is working with the California Transportation Commission (CTC) as well as evaluating alternative funding to keep this project on schedule and move directly into construction. The OCTA Board is scheduled to approve the OCTA/Caltrans Construction Cooperative Agreement and authorize the release of the Request for Proposals (RFP) for consultant construction management services in July 2017.

Project B

I-5, I-405 to SR-55

Contact: Rose Casey, Highways
(714) 560-5729

Status: Environmental Phase Underway - 64% Complete

Summary: This project will add one general purpose lane in each direction of the I-5 corridor and improve the interchanges in the area between SR-55 and SR-133 (near the El Toro "Y" and I-405) in Tustin and Irvine. The environmental study will consider the addition of one general purpose lane on I-5 between just north of I-405 to SR-55. Additional features of Project B include improvements to various interchange ramps. Auxiliary lanes could be added in some areas and re-established in other areas within the project limits. During the quarter, the consultant continued working on technical studies and obtained approval on a number of technical studies. The final Environmental Document is expected to be complete in October 2018.

Measure M2

Progress Report

FREEWAYS



Project C & Part of Project D

I-5, Avenida Pico to Avenida Vista Hermosa/Avenida Pico Interchange

Contact: Rose Casey, Highways
(714) 560-5729

Status: Construction Underway - 69% Complete

Summary: This segment adds a carpool lane in each direction on I-5 between Avenida Pico and Avenida Vista Hermosa in San Clemente, and also includes major improvements to the Avenida Pico Interchange (part of Project D), which will also add bicycle lanes in both directions of Avenida Pico. Construction began in February 2015. During the quarter, construction of the bridge and the Avenida Pico retaining wall were completed, and construction of the main line roadway section is ongoing. Construction is scheduled to be 100 percent complete in mid-2018.

I-5, Avenida Vista Hermosa to Pacific Coast Highway

Contact: Rose Casey, Highways
(714) 560-5729

Status: Construction Underway - 99% Complete

Summary: This segment adds a carpool lane in each direction of I-5 between Avenida Vista Hermosa and Pacific Coast Highway (PCH) in San Clemente, and also includes reconstructing on and off ramps at Avenida Vista Hermosa and Camino de Estrella. Construction began in September 2014. During the quarter, landscaping work continued, and signage and electrical systems were installed throughout the project. Construction is scheduled to be 100 percent complete by the end of July 2017. The added carpool lanes will be open to traffic when the segments at either side of this improvement are complete in early 2018. Due to numerous rain delays and some construction related work, this project is marked "red" in the Capital Action Plan, signifying a delay of over three months beyond the original schedule.

I-5, Pacific Coast Highway to San Juan Creek Road

Contact: Rose Casey, Highways
(714) 560-5729

Status: Construction Underway - 92% Complete

Summary: This segment will add one carpool lane in each direction of the I-5 between PCH and San Juan Creek Road in the cities of San Clemente, Dana Point, and San Juan Capistrano. Project improvements also include reconstructing on and off ramps at PCH/Camino Las Ramblas. Construction began in March 2014. During the quarter, traffic in both directions was shifted to the outside lanes and work on the median began. In the fall of 2015, the Board was informed that a soil issued was identified, which would delay project completion. As a result, this project is marked "red" in the Capital Action Plan, signifying a delay of more than three months, with a revised completion date extending at least 19 months past the original schedule (September 2016). Construction work is scheduled to be 100 percent complete in early 2018.

Continues on the next page...

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FREEWAYS



Project C & Part of Project D continued from previous page...

I-5, SR-73 to Oso Parkway/Avery Parkway Interchange (Segment 1)

Contact: Rose Casey, Highways
(714) 560-5729

Status: Design Phase Underway - 95% Complete

Summary: This project will make improvements along I-5 between SR-73 and Oso Parkway in the cities of Laguna Hills, Laguna Niguel, and Mission Viejo. The proposed improvements include the addition of a general purpose lane in each direction and reconstruction of the Avery Parkway Interchange (part of Project D). During the quarter, comments were received from Caltrans on ROW maps. All comments were addressed and maps were re-submitted for final review. Staff continued to work with Caltrans regarding ROW support services and funding. With 95 percent PS&E submitted to Caltrans on June 14, 2017, the plans identify a higher cost estimate. Project costs increased due to unit price increases, rise in Caltrans support costs, and schedule changes to address bird nesting season restrictions. Staff is working with the CTC to keep the project on schedule and move directly into construction. Design work is anticipated to be complete in 2018. Due to extended ROW coordination, this project is marked “red” in the Capital Action Plan, signifying a delay of over three months beyond the original schedule.

I-5, Oso Parkway to Alicia Parkway/La Paz Road Interchange (Segment 2)

Contact: Rose Casey, Highways
(714) 560-5729

Status: Design Phase Underway - 90% Complete

Summary: This project will make improvements along I-5 between Oso Parkway and Alicia Parkway in the cities of Mission Viejo, Laguna Hills, and Lake Forest. The proposed improvements include the addition of a general purpose lane in each direction and reconstruction of the La Paz Road Interchange. The design phase is currently underway. Major activities this quarter included working on responses to Caltrans’ comments on the 95 percent PS&E submittal, continued coordination on the aesthetics concept plan, off-site sound walls, service contract with Southern California Rail Road Association (SCRRA) and Metrolink, and with Caltrans on ROW and utilities. Federal authorization to begin work on the ROW phase was granted in December 2016. Due to extended ROW coordination, this project is marked “red ” in the Capital Action Plan, signifying a delay of over three months beyond the original schedule.

I-5, Alicia Parkway to El Toro Road (Segment 3)

Contact: Rose Casey, Highways
(714) 560-5729

Status: Design Phase Underway - 85% Complete

Summary: This project will make improvements along I-5 between Alicia Parkway to El Toro Road in the cities of Lake Forest, Laguna Hills, Laguna Woods and Mission Viejo, including the extension of the second HOV lane from Alicia Parkway to El Toro Road. Major activities this quarter included coordinating with Caltrans regarding the planned work at Aliso Creek and the continued development of a plan to address potential impacts to Avenida De La Carlota and Southern California Edison power lines therein. Meetings have been held with other utility agencies to determine the need, extent and schedules for third party relocations/protection. Due to extended ROW coordination, this project is marked “red ” in the Capital Action Plan, signifying a delay of over three months beyond the original schedule.

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Project D

This project will update and improve key I-5 interchanges at Avenida Pico, Ortega Highway, Avery Parkway, La Paz, and at El Toro Road. Three interchange improvements at La Paz, Avery Parkway, and Avenida Pico are part of Project C.

I-5, El Toro Road Interchange

Contact: Rose Casey, Highways
(714) 560-5729

Status: Environmental Phase Underway - 10% Complete

Summary: This project includes four different alternatives that consider modifications to the existing interchange, which range from a I-5 southbound direct connector to El Toro Road to modifications in how existing off ramp intersections operate. The Cooperative Agreement for the Environmental Phase between OCTA and Caltrans was approved by the Board on October 10, 2016. The E-76 package to allow Caltrans to begin work was approved in April 2017 by Federal Highway Administration (FHWA) and work began in May 2017. An update by Caltrans on this project was presented to the OCTA Board in May 2017. The Environmental Phase is anticipated to be completed in late 2019.

I-5, Ortega Highway Interchange

Contact: Rose Casey, Highways
(714) 560-5729

Status: PROJECT COMPLETE



Summary: Construction began in February 2013 to reconstruct the SR-74 Ortega Highway Bridge over I-5, and improve local traffic flow along SR-74 and Del Obispo Street in the City of San Juan Capistrano. All lanes on the new bridge were opened to traffic on September 4, 2015. A dedication ceremony was held on October 1, 2015. The project was officially completed on January 15, 2016.

State Route 22 (SR-22) Project

Project E

SR-22, Access Improvements

Contact: Rose Casey, Highways
(714) 560-5729

Status: PROJECT COMPLETE



Summary: Completed in 2008, Project E made improvements at three key SR-22 interchanges (Brookhurst Street, Euclid Street, and Harbor Boulevard) in the City of Garden Grove to reduce freeway and street congestion in the area. This M2 project was completed early as a “bonus project” provided by the original Measure M (M1).



State Route 55 (SR-55) Projects

Project F

SR-55, I-405 to I-5

Contact: Rose Casey, Highways
(714) 560-5729

Status: Environmental Phase Underway - 95% Complete

Summary: This project will widen SR-55 in the cities of Irvine, Santa Ana, and Tustin. The PDT has updated all technical studies and completed the Supplemental Draft Project Report and Environmental Document (SDPR & ED). The SDPR & ED were circulated for public review from April 3 to May 3 and a public hearing was held on April 20, 2017. Activities this quarter include geometric refinement, and draft Fact Sheet and draft Relocation Impact Statement development. The project is on schedule to obtain SPR and ED approval by the end of September 2017. During the quarter, staff received the ROW assumptions for this project. The review resulted in a project cost increase to address potential ROW risk. Additionally, on June 12th the Board executed a Cooperative Agreement with Caltrans and released the RFP for PS&E. The project is marked “red” in the Capital Action Plan, signifying a delay of more than three months. This project has been delayed by more than four years from its original schedule, due to differences in project determination between OCTA and Caltrans.

SR-55, I-5 to SR-91

Contact: Rose Casey, Highways
(714) 560-5729

Status: Environmental Phase Underway - 5% Complete

Summary: This project will add capacity between I-5 and SR 22, and provide operational improvements between SR-22 and SR-91 in the cities of Orange, Santa Ana, Tustin, and Anaheim. The environmental study will consider the addition of one general purpose lane in each direction to SR-55 between SR-22 and the I-5, and provide operational improvements on SR-55 between SR-22 and SR-91. During the quarter, focus meetings with Caltrans and cities were held and the PDT approved to move forward with 1 build alternative with design options. The traffic methodology memo has been approved and the consultant initiated the traffic study. The Environmental Phase is anticipated to be complete in 2020.



State Route 57 (SR-57) Projects

Project G

SR-57 NB, Katella Avenue to Lincoln Avenue

Contact: Rose Casey, Highways
(714) 560-5729

Status: PROJECT COMPLETE



Summary: This project increased capacity and improved operations on northbound SR-57 between Katella Avenue and Lincoln Avenue in the City of Anaheim with the addition of a new 3-mile general purpose lane, on- and off-ramp improvements, and sound walls. Bridges at Katella Avenue and Douglas Road were also widened in the northbound direction. The project opened to traffic on November 19, 2014 and completed on April 21, 2015.

SR-57 NB, Orangethorpe Avenue to Yorba Linda Boulevard

Contact: Rose Casey, Highways
(714) 560-5729

Status: PROJECT COMPLETE



Summary: This project increased capacity and improved operations on northbound SR-57 with a new 2.5-mile northbound general-purpose lane between Orangethorpe Avenue in the City of Placentia to Yorba Linda Boulevard in the City of Fullerton. In addition to the new lane, capital improvements include reconstruction of northbound on- and off-ramps, widening of seven bridges, and the addition of soundwalls. The new general purpose lane was opened to traffic on April 28, 2014. The project was completed on November 6, 2014.

SR-57 NB, Yorba Linda Boulevard to Lambert Road

Contact: Rose Casey, Highways
(714) 560-5729

Status: PROJECT COMPLETE



Summary: Completed on May 2, 2014, this project improved capacity, operations, and traffic flow on SR-57 with the addition of a new 2.5-mile northbound general-purpose lane between Yorba Linda Boulevard in the City of Fullerton and Lambert Road in the City of Brea. Additional project benefits include on- and off-ramp improvements, the widening and seismic retrofit (as required) of six bridges in the northbound direction and the addition of soundwalls. Existing lanes and shoulders were also widened to standard widths, enhancing safety for motorists. The new general purpose lane was opened to traffic on September 23, 2013.

Measure M2

Progress Report

FREEWAYS



Project G continued from previous page...

SR-57 NB, Lambert Road to Tonner Canyon Road

Status: Conceptual Phase Complete, Further Schedule TBD

Summary: Caltrans previously completed a Project Study Report/Project Development Support document for the Lambert Road to Tonner Canyon Road segment, which will add a truck-climbing lane from Lambert Road to Tonner Canyon Road in the City of Brea. The segment will be cleared environmentally by 2020. Future work will be planned so that it coincides with related work by LA Metro across the county line. Funding for environmental phase for this project was proposed to be included in the 2016 STIP but was removed due to funding constraints. Staff will evaluate alternative funding sources.

Contact: Rose Casey, Highways
(714) 560-5729

SR-57 NB, Orangewood Avenue to Katella Avenue

Status: Environmental Phase Underway - 15% Complete

Summary: This project will add capacity in the northbound direction of SR-57 from Orangewood Avenue to Katella Avenue in the cities of Anaheim and Orange. Improvements under study include adding a northbound general purpose lane to join the northbound general purpose lane which was opened to traffic in 2014 between Katella Avenue and Lincoln Avenue. During the quarter, technical studies continued and an initial public information meeting was held in the City of Orange on June 22, 2017. The Environmental Phase is anticipated to be complete in late 2018.

Contact: Rose Casey, Highways
(714) 560-5729

State Route 91 (SR-91) Projects

Project H

SR-91 WB, I-5 to SR-57

Status: PROJECT COMPLETE

Summary: This project increased capacity in the westbound direction of SR-91 by adding an additional general purpose lane in the westbound direction between Anaheim and Fullerton, and provided operational improvements at on and off-ramps between Brookhurst Street and State College Boulevard. Construction is 100 percent complete, as of June 23, 2016. Consultant-supplied construction management services ended on September 29, 2016. The general purpose lane was opened to traffic on March 7, 2016.



Contact: Rose Casey, Highways
(714) 560-5729

Measure M2

Progress Report

FREEWAYS



Project I

SR-91, SR-55 to Tustin Avenue Interchange

Status: PROJECT COMPLETE



Contact: Rose Casey, Highways
(714) 560-5729

Summary: This project improved traffic flow at the SR-55/SR-91 interchange by adding a westbound auxiliary lane beginning at the northbound SR-55 to westbound SR-91 connector through the Tustin Avenue interchange in the City of Anaheim. The project was intended to relieve weaving congestion in the area and included reconstruction of the westbound side of the Santa Ana River Bridge to accommodate the additional lane. The bypass lane was open to traffic on May 14, 2016. Construction is 100 percent complete. Contract Acceptance was granted on October 31, 2016.

SR-91, SR-55 to SR-57

Status: Environmental Phase Underway - 40% Complete

Contact: Rose Casey, Highways
(714) 560-5729

Summary: This project will improve traffic flow and operations along SR-91 within the cities of Fullerton and Anaheim. The study will look at the addition of one general purpose lane eastbound between SR-57 and SR-55, and one general purpose lane westbound from Glassell Street to State College Boulevard. Additional features of this project include improvements to various interchanges. Auxiliary lanes will be added in some segments and re-established in others within the project limits. This quarter, the consultant continued working on technical documents. M2 and federal funds would pay for the mainline freeway improvements and future funding would need to be identified for connector portions of the project. Due to Caltrans requiring extra work for the unfunded study, the project is marked "red" in the Capital Action Plan with a delay of more than one year from its original schedule. The project is being re-baselined and the environmental phase is expected to be complete in mid-2019.

Project J

SR-91, SR-55 to SR-241

Status: PROJECT COMPLETE



Contact: Rose Casey, Highways
(714) 560-5729

Summary: This completed Project J segment added six miles in the westbound and eastbound direction to a key stretch of SR-91 between SR-55 and SR-241 in the cities of Anaheim and Yorba Linda. In addition to adding 12 lane miles to SR-91, the project also delivered a much needed second eastbound exit lane at the Lakeview Avenue, Imperial Highway and Yorba Linda Boulevard/Weir Canyon Road off-ramps. Beyond these capital improvements, crews completed work on safety barriers, lane striping and soundwalls. Completion of this project in March 2013 means a total of 18 lane miles have been added to SR-91 since December 2010.

Continues on the next page...

Measure M2

Progress Report

FREEWAYS



Project J continued from previous page...

SR-91 EB, SR-241 to SR-71

Status: PROJECT COMPLETE



Contact: Rose Casey, Highways
(714) 560-5729

Summary: Completed in January 2011, this segment added six miles through a key stretch of SR-91 between Orange County's SR-241 and Riverside County's SR-71. The project improves mobility and operations by reducing traffic weaving from traffic exiting at SR-71 and Green River Road. An additional eastbound general purpose lane on SR-91 was added and all existing eastbound lanes and shoulders were widened. Because this project was shovel-ready, OCTA was able to obtain American Recovery and Reinvestment Act (ARRA) funding for this M2 project, saving M2 revenues for future projects.

SR-91, SR-241 to I-15

Contact: Rose Casey, Highways
(714) 560-5729

Status: RCTC's Design-Build - Initial Phase Complete March 20, 2017

Summary: The purpose of this project is to extend the 91 Express Lanes eastward from its current terminus in Anaheim to I-15 in Riverside County. This project will also add one general purpose lane in each direction of SR-91, from SR-71 to I-15, and construct various interchange and operational improvements. On March 20, 2017, the RCTC contractors completed a \$1.3 billion freeway improvement project. While the portion of this project between SR-241 and the Orange County/Riverside County line is part of OCTA's M2 Project J, the matching segment between the county line and SR-71 is part of RCTC's Measure A. With RCTC's first project effort to extend the 91 Express Lanes and add a general purpose lane east of SR-71, construction of the final additional general purpose lane between SR-241 and SR-71 will take place post-2035. The ultimate project widens all SR-91 general purpose lanes to standard lane and shoulder widths from SR-241 to SR-71 (RCTC is responsible for the lane improvements between Green River and SR-71 while OCTA will be responsible for the lane improvements west of Green River to SR-241). To maintain synchronization, these general purpose lanes improvements, which span both counties, will be scheduled to ensure coordinated delivery of both portions of the project, and will provide a continuous segment that stretches from SR-241 to SR-71. This action is consistent with the 2017 SR-91 Implementation Plan.

Interstate 405 (I-405) Projects

Project K

I-405, SR-55 to I-605

Contact: Rose Casey, Highways
(714) 560-5729

Status: Design-Build Contract Underway

Summary: OCTA and Caltrans are working together to widen I-405 through the cities of Costa Mesa, Fountain Valley, Garden Grove, Huntington Beach, Los Alamitos, Seal Beach, and Westminster. These improvements will add one

Measure M2

Progress Report

FREEWAYS



Project K continued from previous page...

general purpose lane, add a second HOV lane to be combined with the existing HOV lane providing a dual express lane facility, and improve the local interchanges along the corridor from SR-73 to I-605. *

On May 8, staff provided a project update to the Board. On June 12, the Board approved a reimbursement agreement between OCTA and the West Orange County Water Board for the relocation of a water line impacted by the project. On June 26, the Board approved the Transportation Infrastructure Finance and Innovation Act (TIFIA) loan agreement between OCTA and the USDOT. On June 29, the USDOT Build America Bureau, Federal Credit Council on Finance recommended the TIFIA loan for approval by the Secretary of Transportation.

During the quarter, work continued on ROW acquisition, utility coordination, environmental permitting and re-validations, TIFIA loan pursuit, and development of the toll lanes system integrator procurement documents. Other work includes review of design builder submittals including the draft baseline schedule, quality management plan, transportation management plan, and preliminary design submittals. Construction is expected to be complete in May 2023.

*On July 25, 2014, despite OCTA's Board recommendation to select Alternative 1 (the Measure M, single general purpose lane alternative) Caltrans informed OCTA that Alternative 3 (general purpose lane and second HOV lane to be combined with existing HOV lane providing dual tolled express lane facility) would be the project preferred alternative. To ensure local control over how the express lane facility would be operated, the Board decided that OCTA would lead this project with the clear understanding that Measure M would only fund the general purpose lane portion of the project and that the second HOV lane/Express lane facility would be funded separately.

Project L

I-405, I-5 to the SR-55

Status: Environmental Phase Underway - 78% Complete

Summary: This project will add one general purpose lane in each direction of the I-405 corridor and improve the interchanges in the area between I-5 and SR-55 in Irvine. Additional features of Project L include improvements to various interchanges, auxiliary lanes and ramps. During the quarter, the consultant continued working on technical studies and obtained approval on all of the environmental technical studies and a number of engineering technical studies. The final Environmental Document is expected to be complete in July 2018.

Measure M2

Progress Report

FREEWAYS



Interstate 605 (I-605) Project

Project M

I-605, I-605 and Katella Interchange Improvements

Contact: Rose Casey, Highways
(714) 560-5729

Status: Environmental Phase Underway - 48% Complete

Summary: This project will improve freeway access and arterial connection to I-605 at Katella Avenue in the City of Los Alamitos and the County of Orange. Improvements under this project may include enhancements at the on-ramps and off-ramps in addition to operational improvements on Katella Avenue at the I-605 Interchange. With Alternative 4 removed from further consideration, the remaining two build alternatives include modification of interchange ramps and lane configurations on Katella Avenue from Coyote Creek Channel to Civic Center Drive. During the quarter, the consultant continued working on technical studies and an initial public information meeting was held in the City of Los Alamitos on June 29, 2017. The final Environmental Document is anticipated to be completed in November 2018.

Freeway Service Patrol

Project N

Freeway Service Patrol

Contact: Sue Zuhlke, Motorist Services
(714) 560-5574

Status: Service Ongoing

Summary: M2's Freeway Service Patrol (FSP) began operation in June 2012 and provides tow truck service for motorists with disabled vehicles on the freeway system to help quickly clear freeway lanes and minimize congestion. During the quarter, the midday service provided assistance to 2,047 motorists, weekend service provided assistance to 996 motorists, and construction service provided assistance to 374 motorists. Since inception, M2 and construction-funded FSP has provided a total of 59,512 assists to motorists on the Orange County freeway system.

Measure M2

Progress Report

STREETS & ROADS



Project O

Contact: Sam Kaur, Planning
(714) 560-5673

Regional Capacity Program

Status: 2017 Call for Projects Completed

Summary: This program, in combination with required local matching funds, provides funding for improvements on Orange County's Master Plan of Arterial Highways. On August 8, 2016, the Board approved the release of the seventh call for projects. The 2017 seventh Call for Projects allocated approximately \$32 million available to fund additional road improvements throughout the County. OCTA received 16 applications for a total of \$50.3 million in funding requests. On April 10, 2017, the OCTA Board approved funding for 13 projects, in an amount totaling \$32.24 million. Since 2011, 135 projects totaling more than \$263 million have been awarded by the Board to date.

OC Bridges Railroad Program

This program will build seven grade separations (either under or over passes) where high volume streets are impacted by freight trains along the BNSF Railroad in North County. A status for each of the seven projects is included below. As of the end of this quarter, five are complete (Kraemer, Placentia, Orangethorpe, Tustin/Rose, and Lakeview), and the two remaining projects are scheduled to be completed in 2017 and 2018.

Kraemer Boulevard Grade Separation



Contact: Rose Casey, Highways
(714) 560-5729

Status: PROJECT COMPLETE

Summary: The project located at Kraemer Boulevard railroad crossing is grade separated and open to traffic. The project separated the local street from railroad tracks in the City of Placentia by building an underpass for vehicular traffic. The grade separation was opened to traffic on June 28, 2014, and an event was held on July 8, 2014 to commemorate the opening. Project acceptance by the City of Anaheim and the City of Placentia, respectively, occurred in December 2014 and the cities assumed full maintenance responsibilities. In December 2015, the one-year warranty period expired with no issues or repairs identified.

Lakeview Avenue Grade Separation



Contact: Rose Casey, Highways
(714) 560-5729

Status: PROJECT COMPLETE

Summary: The project located at Lakeview Avenue railroad crossing grade separated the local street from railroad tracks in the cities of Anaheim and Placentia by building a bridge for vehicular traffic over the railroad crossing and reconfiguring the intersection of Lakeview Avenue and Orangethorpe Avenue. Construction began on July 1, 2014. The deck for the new Atwood Channel Bridge was poured and completed in late February 2017. Lakeview Avenue

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Project O continued from previous page...

(north of Orangethorpe Avenue) was closed to traffic on February 25, 2015, and was reopened with the connector road in late July 2016. Project activities this quarter continued included irrigation, landscaping, parking lots restoration, lighting, signals, pilasters, metal railing, and asphalt paving. Lakeview Avenue (south of Orangethorpe Avenue) was closed to through traffic on March 13, 2015, and reopened on June 5, 2017. Construction acceptance from the cities of Anaheim and Placentia was obtained on June 5, 2017 and OCTA has turned over the maintenance responsibilities to the cities and commenced the one year warranty. Minor construction punchlist items are ongoing and close-out activities were initiated.

Orangethorpe Avenue Grade Separation

Contact: Rose Casey, Highways
(714) 560-5729

Status: PROJECT COMPLETE



Summary: The project located at Orangethorpe Avenue railroad crossing is grade separated and open to traffic. The project separated the local street from railroad tracks in the cities of Placentia and Anaheim by building a bridge for vehicular traffic over the railroad tracks. On May 17, 2016, a joint-grand opening event was held to commemorate the opening to traffic for the Orangethorpe and Tustin/Rose Grade Separation projects. OCTA oversaw construction of the project which was completed during the quarter. Final construction activities included landscaping, irrigation, survey monumentation, and construction close-out activities. Construction was completed in October 2016 and construction acceptance was obtained from the cities of Anaheim and Placentia on October 25, 2016. OCTA has turned over the maintenance responsibilities to the cities and commenced the one-year warranty.

Placentia Avenue Grade Separation

Contact: Rose Casey, Highways
(714) 560-5729

Status: PROJECT COMPLETE



Summary: The project located at Placentia Avenue railroad crossing is grade separated and open to traffic. This project separated the local street from railroad tracks in the city of Placentia by building an underpass for vehicular traffic. An event was held on March 12, 2014, to commemorate the opening to traffic. Project acceptance by the City of Anaheim and the City of Placentia, respectively, occurred in December 2014, and the cities assumed full maintenance responsibilities. In December 2015, the one-year warranty period expired with no issues or repairs identified.

Raymond Avenue Grade Separation

Contact: Rose Casey, Highways
(714) 560-5729

Status: Construction Underway - **82% Complete**

Summary: The project located at Raymond Avenue railroad crossing will grade separate the local street from railroad tracks in the City of Fullerton by taking vehicular traffic under the railroad crossing. The City of Fullerton is managing construction and OCTA is providing construction oversight, public outreach, railroad coordination, and ROW support. Construction began on June 2, 2014. Activities this quarter continue to include retaining walls and

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Project O continued from previous page...

Valencia Drive bridge barrier railing, pump station, storm drain, waterline, street lighting, roadway pavement, and mass excavation. Construction is expected to be 100 percent complete by summer 2018.

State College Boulevard Grade Separation

Contact: Rose Casey, Highways
(714) 560-5729

Status: Construction Underway - **85% Complete**

Summary: The project located at State College Boulevard railroad crossing will grade separate the local street from railroad tracks in the City of Fullerton by taking vehicular traffic under the railroad crossing. The City of Fullerton is managing the construction and OCTA is providing construction oversight, public outreach, railroad coordination, and ROW support. Construction activities this quarter continue to include retaining walls, pump station, mass excavation, electrical, storm drain, street lighting, traffic signal, and sacrificial beams placement on the bridge. State College Boulevard, north of the railroad bridge, was re-opened to vehicular traffic on January 4, 2017. Construction is expected to be completed by early 2018.

Tustin Avenue/ Rose Drive Grade Separation

Contact: Rose Casey, Highways
(714) 560-5729

Status: **PROJECT COMPLETE**



Summary: The project located at Tustin Avenue/Rose Drive railroad crossing is grade separated and open to traffic. The project separated the local street from railroad tracks in the cities of Placentia and Anaheim by building a bridge over the railroad crossing for vehicular traffic. On May 17, 2016, a joint-grand opening event was held to commemorate the opening to traffic for the Orangethorpe and Tustin/Rose Grade Separation projects. OCTA oversaw construction of the project, which was completed during the quarter. Final construction activities included traffic signal controller, landscaping, irrigation, survey monumentation, and construction close-out and warranty activities. Construction was completed in October 2016 and construction acceptance was obtained from the cities of Anaheim and Placentia on October 25, 2016. OCTA has turned over the maintenance responsibilities to the cities and commenced the one-year warranty.



Project P

Contact: Anup Kulkarni, Planning
(714) 560-5867

Regional Traffic Signal Synchronization Program (RTSSP)

Status: Ongoing (See current RTSSP projects' statuses illustrated on the map on the next page)

Summary: This program provides funding and assistance to implement multi-agency signal synchronization. The target of the program is to regularly coordinate signals for 2,000 intersections along 750 miles of roadway as the basis for synchronized operation across Orange County. The program will enhance the efficiency of the street grid and reduce travel delay.

On April 10, 2017, the Board approved funding for five projects totaling \$2.5 million as part of the 2017 RTSSP Call for Projects.

To date, OCTA and local agencies have synchronized more than 2,000 intersections along more than 540 miles of streets (or 59 projects). There have been seven rounds of funding to date, providing a total of 84 projects with more than \$72.5 million in funding awarded by the Board.

Project Q

Contact: Vicki Austin, Finance
(714) 560-5692

Local Fair Share Program

Status: Ongoing

Summary: This program provides flexible funding to help cities and the County of Orange keep up with the rising cost of repairing the aging street system. This program is intended to augment, not replace, existing transportation expenditures of the cities and the County. All local agencies have been found eligible to receive Local Fair Share funds. On a bi-monthly basis, 18 percent of net revenues are allocated to local agencies by formula. Approximately \$288.5 million in Local Fair Share payments have been provided to local agencies as of the end of this quarter.

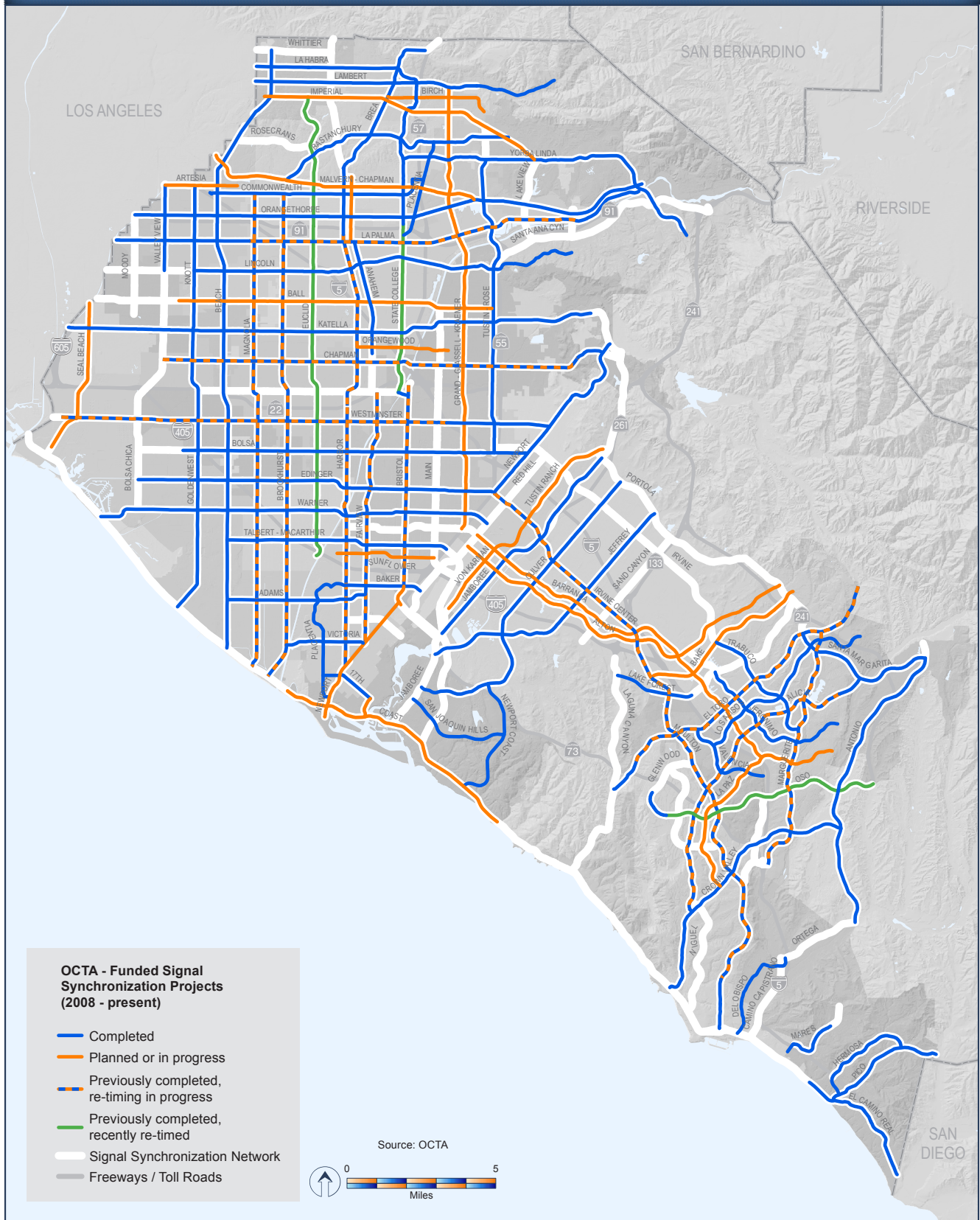
See pages 47-48 for funding allocation by local agency.

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OCTA - Funded Signal Synchronization Projects (2008 - present)





Project R

High Frequency Metrolink Service

Project R will increase rail services within the County and provide additional Metrolink service north of Fullerton to Los Angeles. The program will provide for track improvements, the addition of trains and parking capacity, upgraded stations, and safety enhancements to allow cities to establish quiet zones along the tracks. This program also includes funding for grade crossing improvements at high volume arterial streets, which cross Metrolink tracks.

Metrolink Grade Crossing Improvements

Status: PROJECT COMPLETE



Contact: Jennifer Bergener, Rail
(714) 560-5462

Summary: Enhancement of the designated 52 Orange County at-grade rail-highway crossings was completed as part of the Metrolink Service Expansion Program (MSEP) in October 2012. Completion of the safety improvements provided each corridor city with the opportunity to establish a “quiet zone” at their respective crossings. Quiet zones are intended to prohibit the sounding of train horns through designated crossings, except in the case of emergencies, construction work, or safety concerns identified by the train engineer. The cities of Anaheim, Dana Point, Irvine, Orange, Santa Ana, San Clemente, San Juan Capistrano, and Tustin have established quiet zones within their communities.

Metrolink Service Expansion Program

Status: Service Ongoing

Contact: Jennifer Bergener, Rail
(714) 560-5462

Summary: Following the completion of the Metrolink Service Expansion Program (MSEP) improvements in 2012, OCTA deployed a total of ten new Metrolink intra-county trains operating between Fullerton and Laguna Niguel/ Mission Viejo, primarily during midday and evening hours. Efforts to increase ridership through a redeployment of the trains without significantly impacting operating costs have been underway since 2014. In April 2015, several schedule changes added a connection between the 91 Line and the intra-county service at Fullerton to allow a later southbound peak evening departure from Los Angeles to Orange County. Staff continues to monitor ridership on these trains, with data showing that boardings have increased by 15 percent over the last three years.

Part of OCTA’s re-deployment plan involves providing new trips from Orange County to Los Angeles. Staff continues to work with BNSF, RCTC, and Metro to address track-sharing issues, operating constraints and funding that will impact the options for redeployment. Metrolink is the lead in the discussions with the BNSF Railway to evaluate the current shared use and indemnification/liability agreements that govern the use of each agencies respective railroad rights of way. These discussions are ongoing and special counsel has been brought in to assist. Operation of

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additional Metrolink trains to Los Angeles is contingent on addressing indemnification and liability agreements and the completion of a triple track project on the BNSF Railway between Fullerton and Los Angeles, which is currently anticipated to be in late 2017. Metrolink is the lead agency responsible for the negotiations.

Rail Corridor & Station Improvements

Additionally under the Metrolink Service Expansion Program, funding is provided for rail line and station improvements to accommodate increased service. Rail station parking lot expansions, better access to platforms, among other improvements have been made or are underway. For schedule information on station improvement projects, please see the Capital Action Plan pages at the back of this report.

Anaheim Canyon Metrolink Station

This OCTA-led project will include construction of a second main track and platform to lengthen the existing platform for improved pedestrian circulation, and add of benches, shade structures, and Ticket Vending Machines at the Anaheim Canyon Metrolink Station. During this quarter, a RFP for final design (PS&E) was released by the Board in April and final selection of the consultant will be presented to the Board in August. Additionally, preliminary plans are complete and the project is now environmentally cleared. Construction of the project is expected to begin in October 2019 and take 15 months.

Fullerton Transportation Center Improvements - 5% Complete

Completed early on, a new 5-level parking structure, was constructed to provide additional transit parking at the Fullerton Transportation Center for both intercity rail service and commuter rail passengers. This City-led project was completed on June 19, 2012. After completion, an elevator upgrade project was proposed with leftover savings. The elevator project will modify the existing pedestrian bridge to add two new traction elevators, one on each side. The City of Fullerton is the lead on this project as well. Notice to Proceed was issued in January 2016 and improvements to the public restrooms were completed; however, the elevator portion of the project has experienced several delays due to sub-contractor issues and utility conflicts. The City of Fullerton is now projecting the completion of the project to be in September of 2018. This project is marked “red” in the Capital Action Plan, signifying a delay of more than three months.

Laguna Niguel/Mission Viejo Station - 78% Complete

The Laguna Niguel/Mission Viejo station accessibility improvements project is currently in the construction phase. Improvements include new ADA-compliant access ramps on either side of the pedestrian undercrossing and a unisex ADA-compliant restroom. The contractor has substantially completed major concrete work related to the ramps. The contractor will continue wall finishes, installation of handrails and guardrails, restroom, vending machine room, and completing the passenger canopies. Due to various submittal requirements taking longer than expected and weather delays, staff is anticipating the project will be completed three months beyond the original schedule. As a result, this project is marked “red” in the Capital Action Plan. The project is expected to be complete in October 2017.

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Project R continued from previous page...

Orange Parking Structure

This project will include a 611-space, 5-level shared use parking structure that will be located on Lemon Street between Chapman Avenue and Maple Street in Orange. The City of Orange is the lead for the design phase. OCTA is the lead for the construction phase of this project. A construction contract was awarded by the OCTA Board on June 12, 2017. Construction will begin the end of July with a ground breaking ceremony scheduled for July 26th. The project is expected to be completed in early 2019. This project is marked “red” in the Capital Action Plan, signifying a delay of more than three months.

Placentia Station

Plans for the proposed Placentia Metrolink Station Project were near completion when the City of Placentia requested to modify them to include a parking structure to be built where surface parking had been designed. On June 27, 2016, the Board approved a new Cooperative Agreement with the City that revised the scope of the project and budget. There will now be a parking structure as part of the project and the City will contribute towards the cost. Design plans at 90% have been completed and are being reviewed. An RFP for construction management services was released in August 2016 and a selection was approved by the Board in December 2016. A contract for these services is expected to be in place in August 2017 so a constructability review can be done. The project is anticipated to begin construction in spring 2018 and is anticipated to be complete in fall 2019. This project’s ability to move into construction is subject to finalizing a track sharing agreement with BNSF.

San Clemente Pier Station Lighting - 100% Complete

This project was completed on March 17, 2017, and is in the closeout phase. OCTA was the lead for design and installation of this project which added lighting to the existing platform and new decorative hand rails at the San Clemente Pier Station.

San Juan Capistrano/Laguna Niguel Passing Siding Project

Currently in the design phase, this project will add approximately 1.8-miles of new passing siding railroad track adjacent to the existing mainline track, which will enhance operational efficiency of passenger services within the LOSSAN rail corridor. The 90 percent design plans have been reviewed by SCRRA and the City of San Juan Capistrano (City). The design will remain at 90 percent as OCTA continues to work with the California Public Utilities Commission and the City to resolve the at-grade crossing status. The overall project cost impacts are currently estimated at \$5.6 million above the original project budget of \$25.3 million, which was based on a preliminary design in 2013. The project cost increase due to necessary changes to the specified retaining wall type, height, and length to account for site constraints, removal of Control Point Avery, replacement of an existing 1940 wooden trestle bridge, and other adjustments covering project support costs and construction cost escalations. Completion of the design phase is expected in December 2017 and construction is expected to begin in late-2018 due to continued discussion to resolve the crossing issue. Project completion is expected in late 2020. The project team continues to reduce the overall schedule impact wherever possible. This project is marked “red” in the Capital Action Plan, signifying a delay of more than three months.

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Project R continued from previous page...

Tustin Parking Structure - 100% Complete

Also completed early on, this project provided additional parking at the Tustin Metrolink Station to meet increased requirements associated with the MSEP by constructing a new 4-story parking structure with approximately 735 spaces, plus on-site surface parking. The parking structure was opened to the public on September 22, 2011.

Additional rail corridor improvements include: completion of the San Clemente Beach Trail Audible Warning System (AWS) project, which provides additional safety improvements and AWS devices at seven pedestrian grade crossings along the beach trail (AWS activation occurred on June 24, 2016); completed Project Study Reports or environmental clearance for six potential grade separation projects along the LOSSAN corridor (State College Avenue, Ball Road, 17th Street, Santa Ana Boulevard, Grand Avenue, and Orangethorpe Avenue); replacement of the San Juan Creek railroad bridge in the City of San Juan Capistrano, which will also accommodate a future bike trail on the south end along the creek (design is 60 percent complete); the Control Point project at Fourth Street in the City of Santa Ana, which will provide rail operational efficiencies; the Railroad ROW Slope Stabilization project, which includes eight locations within the OCTA-owned LOSSAN rail corridor that have been identified for improvements to prevent future erosion and slope instability; video surveillance, and continued implementation of Positive Train Control.

Sand Canyon Grade Separation

Status: PROJECT COMPLETE



Contact: Rose Casey, Highways
(714) 560-5729

Summary: The project located at Sand Canyon Avenue railroad crossing is grade separated and open to traffic. The project separated the local street from railroad tracks in the City of Irvine by constructing an underpass for vehicular traffic. The westbound lanes were opened to traffic on June 12, 2014, and the eastbound lanes were opened to traffic on July 14, 2014. A road opening ceremony was held on August 11, 2014. The project is completed and construction acceptance was obtained from the City of Irvine on January 15, 2016. The project completed the one-year warranty period and no repairs were identified. The project was closed out in mid-January 2017.

Project S

Transit Extensions to Metrolink

In order to broaden the reach of Metrolink to other Orange County cities, communities, and activity centers, Project S includes a competitive program which allows cities to apply for funding to connect passengers to their final destination via transit extension. There are currently two areas of this program: a fixed guideway program (street car) and a rubber tire transit program.

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Project S continued from previous page...

OC Streetcar Project

Contact: Jennifer Bergener, Rail
(714) 560-5462

Status: Design Phase Underway - 89% Complete

Summary: OCTA is serving as the lead agency for the OC Streetcar project. The FTA formally advanced the project into the Project Development phase of the federal New Starts program in May 2015. The FTA has shown strong support for this project by ascribing an overall medium-high rating to it in their Fiscal Year 2018 Annual New Starts Report, which was released in May 2017. The full Notice to Proceed for design was issued in February 2016, and a consultant team was selected to prepare design plans (PS&E) for the project.

Based upon a Risk Workshop that was held in March 2017 to finalize the project scope, schedule and budget, the FTA recommended minor changes to the project cost estimate, increasing the cost by less than one half of one percent from the 30% design cost estimate prepared in July 2016. The updated cost estimate and funding plan were approved by the OCTA Board at their May 22, 2017 meeting. The Board also authorized submission of the Full Funding Grant Agreement Application to the FTA at this meeting. The funding request as well as extensive project readiness documents required for the application were submitted to the FTA in late May 2017. Staff is coordinating with the FTA and their consultants on the federal review of the documents.

During this quarter, the OCTA Board approved additional agreements with the City of Santa Ana and City of Garden Grove's City Councils, which included: construction agreements with the City of Santa Ana and City of Garden Grove and the agreement with the City of Santa Ana for incorporation of streetcar elements at the Santa Ana Regional Transportation Center. The OCTA Board also awarded the Public Awareness Campaign (PAC) contract to Katz Associates. The firm will be assisting with the development and implementation of a PAC during the pre-construction and construction phases of the project.

An environmental analysis for minor design modifications was completed, and staff is coordinating with FTA to obtain approval on the Section 130(c) determination, completing the federal environmental review process. In June, the State Historic Preservation Office concurred that the project would not have an adverse impact on historic properties.

OCTA, and the Cities of Santa Ana and Garden Grove expect all documents pertaining to 90% design plans to be submitted by HNTB Engineering by July 2017. Work is proceeding on preparation of the procurement documents for the Construction Invitation for Bid (IFB) which is scheduled to be released in fall 2017.

The vehicle manufacturing and delivery procurement was extended to early July 2017 in response to a proposer request. Work commenced on the development of the scope of services for the Operation and Maintenance service procurement, which is scheduled to be released in fall 2017.

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Project S continued from previous page...

Bus and Station Van Extension Projects

Status: Service Ongoing for Oakley Vanpool and Anaheim Canyon Metrolink Bus Connection

Contact: Sam Kaur, Planning
(714) 560-5673

Summary: Bus and Station Van Extension projects help enhance the frequency of service in the Metrolink corridor by linking communities within the central core of Orange County. To date, the Board has approved one round of funding for bus and van extension projects, totaling over \$730,000. Four projects located within the cities of Anaheim and Lake Forest were approved for funding by the Board on July 23, 2012. Two projects have implemented service, one has been revised with a scope change, and the other has been cancelled. The vanpool connection from the Irvine Metrolink Station to the Oakley employment center in the City of Lake Forest began in December 2012, and the Anaheim Canyon Metrolink Station Bus Connection began service in February 2013. Following detailed discussions with OCTA staff, the Board approved a scope change submitted by the City on behalf of Panasonic Avionics in December 2015, which utilizes the City's established shuttle program to provide trips between the Irvine Metrolink Station and the Panasonic employment center as an alternative to providing vanpool services. Service associated with Invensys Incorporated in the City of Lake Forest was cancelled at the request of the participant, and the funds have been returned to the program for use in future calls for projects. Service provided in the City of Anaheim carries approximately 90 passengers per day between the station and Anaheim Resort area.

Project T

Convert Metrolink Stations to Regional Gateways that Connect Orange County with High-Speed Rail Systems

Contact: Jennifer Bergener, Rail
(714) 560-5462

Status: PROJECT COMPLETE



Summary: This project constructed the Anaheim Regional Transportation Intermodal Center (ARTIC) located at 2626 East Katella Avenue in the City of Anaheim. In addition to providing transit connections for OCTA bus service, Metrolink and Amtrak service, shuttle and charter bus service, taxis, bikes, and other public and private transportation services, ARTIC also accommodates future high-speed rail trains. The City of Anaheim, which led the construction effort, opened the facility to rail and bus service on December 6, 2014. A ribbon-cutting ceremony was held on December 8, 2014, with a grand opening celebration hosted on December 13, 2014. This facility replaced the former Anaheim Station that was located on the opposite side of the freeway in the Angel Stadium parking lot.



Project U

Project U expands mobility choices for seniors and persons with disabilities, and includes the Senior Mobility Program (SMP), the Senior Non-emergency Medical Transportation Program (SNEMT), and the Fare Stabilization Program. Since inception, a total of approximately \$48.7 million in Project U funding has been provided under M2.

Senior Mobility Program (SMP)

Contact: Curt Burlingame, Transit
(714) 560-5921

Status: Ongoing

Summary: This program provides one percent of net M2 revenues to continue and expand local community transportation service for seniors under the SMP. Since inception, more than \$14.6 million and 1,772,000 boardings have been provided for seniors traveling to medical appointments, nutrition programs shopping destinations, and senior and community center activities. This quarter, approximately \$900,000 was paid out to the 31 participating cities during the month of May*.

**Payments are made every other month (January, March, May, July, September, and November). The amount totaled for one fiscal year quarter either covers one or two payments, depending on the months that fall within that quarter.*

Senior Non-emergency Medical Transportation Program (SNEMT)

Contact: Curt Burlingame, Transit
(714) 560-5921

Status: Ongoing

Summary: This program provides one percent of net M2 revenues to supplement existing countywide senior non-emergency medical transportation services. Since inception, more than \$16.0 million and 578,929 SNEMT boardings have been provided. This quarter, approximately \$950,000 in SNEMT funding was paid to the County of Orange*.

**Payments are made every other month (January, March, May, July, September, and November). The amount totaled for one fiscal year quarter either covers one or two payments, depending on the months that fall within that quarter.*

Fare Stabilization Program

Contact: Sean Murdock, Finance
(714) 560-5685

Status: Ongoing

Summary: Between years 2011-2015, one percent of net M2 revenues was dedicated to stabilize fares and provide fare discounts for bus services and specialized ACCESS services for seniors and persons with disabilities. Effective January 28, 2016, an amendment to the M2 Ordinance No. 3, adjusted this amount to 1.47 percent of net M2 revenues to be dedicated to the Fare Stabilization Program.

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Project U continued from previous page...

Approximately \$1.4 million in revenue was allocated this quarter to support the Fare Stabilization Program. The amount of funding utilized each quarter varies based on ridership. Throughout the quarter, approximately 3,224,986 program-related boardings were recorded on fixed route and ACCESS services. Since inception of the program, more than \$18 million and 79,225,000 program-related boardings have been provided.

Project V

Contact: Sam Kaur, Planning
(714) 560-5673

Community Based Transit/Circulators

Status: 2012 Call for Projects Service Ongoing, 2016 Call for Projects Service Begun

Summary: This project establishes a competitive program for local jurisdictions to develop local bus transit services such as community based circulators and shuttles that complement regional bus and rail services, and meet needs in areas not adequately served by regional transit. On June 24, 2013, the Board approved the first round of funding for \$9.8 million to fund five funding proposals from the cities of Dana Point, Huntington Beach, La Habra, Laguna Beach, and Lake Forest. Funding was approved to implement vanpool services from local employment centers to transportation hubs, special event and seasonal services that operate during heavy traffic periods, and local community circulators that carry passengers between various shopping, medical, and transportation-related centers. Prior to the second Call for Projects, Project V Guidelines were revised in 2015, per Board direction, to encourage more local agency participation. On June 13, 2016 the Board approved \$26.7 million in Project V funds for 17 Capital and Operations grants and \$323,780 for seven planning grants. OCTA staff has completed agreements with the local agencies to implement these projects. Services for the Cities of Westminster, Mission Viejo and San Clemente started in October 2016. OCTA receives ridership reports from local agencies on a regular basis to monitor the success of these services against performance measures adopted by the Board. In general, special event services are performing at high productivity levels. Since fixed route services are struggling to meet the ridership target, OCTA made recommendations to local agencies to conduct outreach efforts and route changes that can help improve the ridership. In April 2017, the City of Westminster sent a letter to OCTA to discontinue the Project V service. Staff will continue to monitor these services to ensure the performance standards are met and will provide reports to the Board on a regular basis. OCTA staff provided a ridership report update to the Board at their June 2017 meeting which showed lower than desirable ridership on some of the routes.



Project W

Contact: Sam Kaur, Planning
(714) 560-5673

Safe Transit Stops

Status: City-Initiated Improvements Underway or Complete; Mobile Ticketing in Use

Summary: This project provides funding for passenger amenities at the 100 busiest transit stops across the County, determined by average daily weekday passenger boardings. Stop improvements will be designed to ease transfers between bus lines and provide passenger amenities such as improved shelters and lighting. On July 14, 2014, the Board determined that 80 percent of available Project W funding (\$4.47 million) would be designated for supporting city-initiated projects, and the remaining 20 percent (\$1.12 million) would be directed towards the development and implementation of regional, customer-facing technologies that benefit the 100 busiest stops. On the same date, the Board approved up to \$1,205,666 for city-initiated improvements and \$370,000 for OCTA-initiated improvements in fiscal year 2014-15.

According to October 2012 ridership data, 15 cities (containing at least one of the 100 busiest stops) are eligible for Safe Transit Stops funding. Seven cities applied for funds, and 51 projects were approved for funding per the July 2014 Board approval. The City of Anaheim was not able to initiate the improvements for their projects and will reapply for funds through the next Call for Projects. The remaining 43 projects have been moving forward. The Cities of Irvine, Westminster, Costa Mesa, Orange, and Brea have completed their projects. The City of Santa Ana awarded their contract in April 2016 and installation of the shelters and other amenities started in June 2017. Staff will continue to monitor progress and report completion in the future.

For OCTA-initiated improvements, the \$370,000 investment has been contributed towards a mobile ticketing application (app) that will make it more convenient for bus customers to purchase bus passes, obtain trip information, and board buses by allowing riders to use their smart phones to display proof of payment or “mobile ticketing.” The smart phone app was launched on June 15, 2016, for OC Fair and Express Bus users and received positive reviews. It is planned to be expanded to include regular fixed route and college pass purchases next quarter, and reduced fare purchases (for Seniors and Persons with Disabilities) early next year.



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Project X

Environmental Cleanup

Contact: Dan Phu, Planning
(714) 560-5907

Status: Ongoing

Summary: This program implements street and highway-related water quality improvement programs and projects that assist agencies countywide with federal Clean Water Act standards for urban runoff. It is intended to augment, not replace existing transportation-related water quality expenditures and to emphasize high-impact capital improvements over local operations and maintenance costs. The Environmental Cleanup Allocation Committee (ECAC) is charged with making recommendations to the Board on the allocation of funds for the Environmental Cleanup Program (ECP). These funds are allocated on a countywide, competitive basis to assist agencies in meeting the Clean Water Act standards for controlling transportation-related pollution.

Project X is composed of a two-tiered funding process focusing on early priorities (Tier 1), and a second program designed to prepare for more comprehensive capital investments (Tier 2). To date, there have been six rounds of funding under the Tier 1 grants program. A total of 138 projects, amounting to nearly \$17 million, have been awarded by the Board since 2011. There have been two rounds of funding under the Tier 2 grants program. A total of 22 projects in the amount of \$27.89 million have been awarded by the Board since 2013. To date, 33 of the 34 Orange County cities plus the County of Orange have received funding under this program. Board approval of the seventh Tier 1 Call for Projects funding recommendations is anticipated in August 2017 in the amount of approximately \$3.1 million.

Staff continues to work with the ECAC and the County of Orange to recommend the appropriate timing of a third Tier 2 Call for Projects.

Part of Projects A-M

Contact: Dan Phu, Planning
(714) 560-5907

Freeway Mitigation Program

Status: Biological Permits Issued and Conservation Plan Implementing Agreement Signed by the Wildlife Agencies

Summary: The Freeway Mitigation Program provides higher-value environmental benefits such as habitat protection, wildlife corridors, and resource preservation in exchange for streamlined project approvals and greater certainty in the delivery of Projects A-M. The program is proceeding as planned, with seven properties (Preserves) acquired (1,300 acres), and 12 restoration projects approved for funding by the Board, totaling approximately 350 acres. The restoration project plans have been approved by the wildlife agencies and are currently at various stages of implementation. The Board has authorized \$42 million (inclusive of setting aside funds for long-term land

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Part of Projects A-M continued from previous page...

management) for property acquisitions, \$10.5 million to fund habitat restoration activities, and \$2.5 million for conservation plan development and program support, for a total of approximately \$55 million.

On June 19, 2017, the United States Fish and Wildlife Service and the California Department of Fish and Wildlife (Wildlife Agencies) finalized the issuance of their respective biological opinion, findings, and associated permits, as well as signed the Conservation Plan Implementing Agreement. Receipt of these permits represent the culmination of years of collaboration and support by the Board, environmental community, and Wildlife Agencies. As a result, the M2 environmental process will be streamlined allowing OCTA to move forward with the M2 freeway projects (as described in the Conservation Plan) with little additional coordination from the Wildlife Agencies. The Conservation Plan also includes a streamlined process for coordination with CDFW for streambed alteration agreements will also be reduced. This is needed for portions of freeway projects that cross through streams and riverbeds. The OCTA Conservation Plan is unique as it is only the second state/federal conservation plans approved in Orange County.

As part of the Conservation Plan process, an endowment is required to be established to pay for the long-term management of the Preserves. It is estimated that it will take up to fifteen years to fully fund the endowment. As anticipated, the first deposit of \$2.9 million for the endowment was made in early 2017. Staff will continue to oversee and manage the Preserves until a long-term manager(s) is established.

To date, five of the seven Preserve resource management plans (RMPs) have been completed. These RMPs guide the management of the Preserves as outlined within the Conservation Plan. OCTA anticipates on releasing the remaining two RMPs to the public by the end of summer 2017. The five previously released RMPs are being finalized and expected to be completed on a similar timeline. Additionally, staff will monitor the progress of all restoration projects and provide status updates to the Environmental Oversight Committee until each project is implemented. A list of scheduled 2017 wilderness Preserve hiking and equestrian riding tours is available on the M2 website at www.PreservingOurLegacy.org.

As part of the safeguards in place for the M2 Program, a 12-member Environmental Oversight Committee (EOC) makes funding allocation recommendations to assist OCTA in acquiring land and restoring habitats in exchange for streamlined project approvals for the M2 freeway improvement projects (A-M). The EOC has led efforts with policy recommendations to the Board and has operated in an open and transparent manner that has garnered the trust of stakeholders, ranging from the environmental community to the recreational community to Orange County citizens.

See map of Preserves and funded restoration properties on the following page.

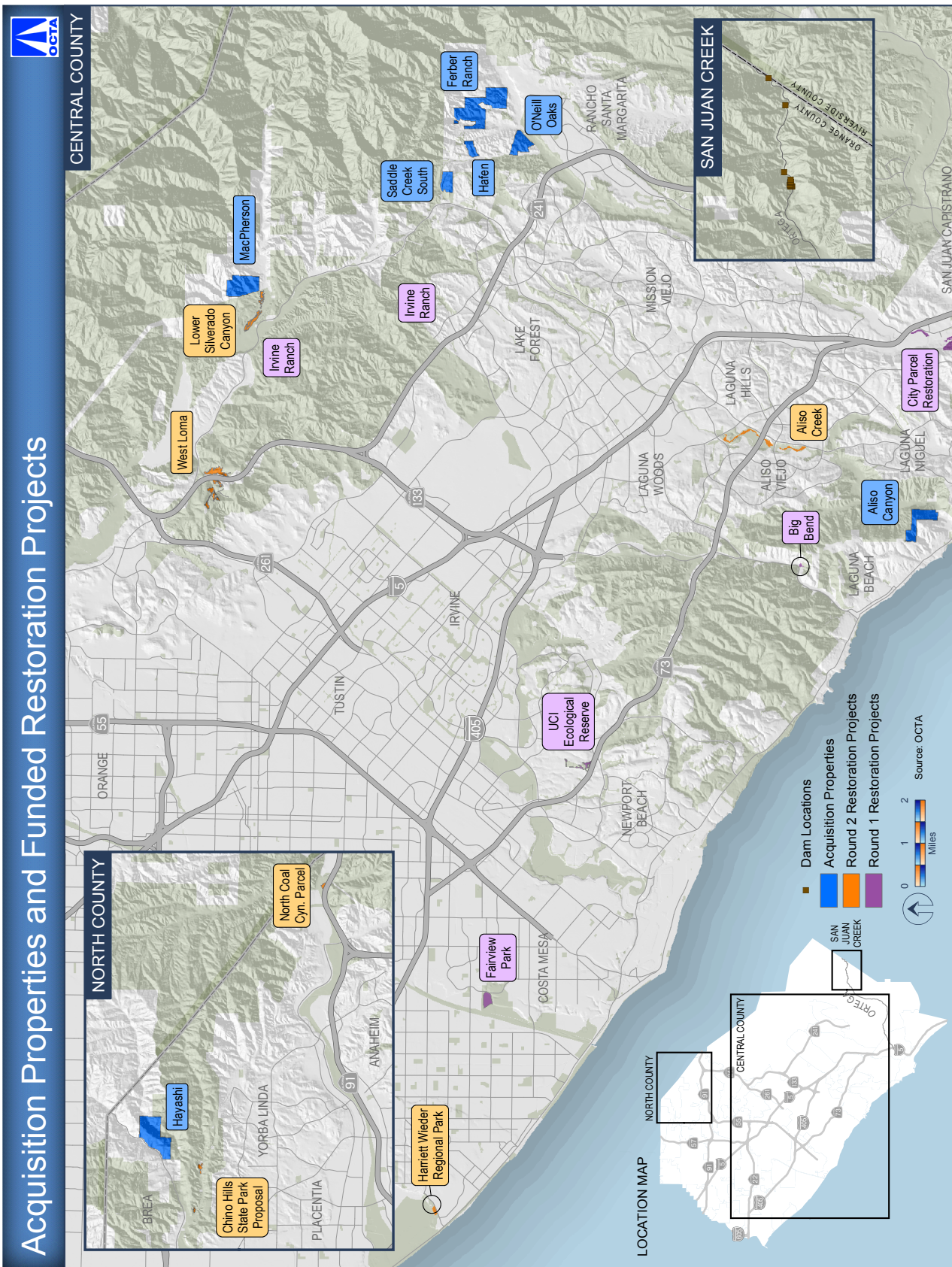
Measure M2

Progress Report

ENVIRONMENTAL



Acquisition Properties and Funded Restoration Projects



Measure M2

Progress Report PROGRAM MGMT



Program Management Office

Contact: Tami Warren, PMO Manager
(714) 560-5590

The Measure M (M1 and M2) Program Management Office (PMO) provides interdivisional coordination for all M-related projects and programs. To ensure agency-wide compliance, the PMO also holds a bi-monthly committee meeting comprised of executive directors and key staff from each of the divisions, who meet to review significant issues and activities within the Measure M programs. This quarter, the focus of the PMO has been on several major items, including the following.

Next 10 Delivery Plan

Staff continues to monitor the progress of the Next 10 Delivery Plan adopted by the Board in November 2016. Tight monitoring of cash flow assumptions versus actual revenue, expense, and schedule activity is underway using a tracking mechanism created for this purpose. This quarter, OCTA's contracted forecasting agencies began their 2017 Measure M2 30-year economic outlook for taxable sales presentations. Presentations to the Finance Committee by each agency are scheduled to conclude in August. While final sales tax receipts for Fiscal Year 2016-17 have not yet been received, the forecasting agencies' economic outlook provided to date indicate further decline in sales tax collections. Staff is currently reviewing the Next 10 Plan and preparing an update planned to go to the Board in the fall of 2017.

2012-2015 M2 Performance Assessment Update

Measure M2's Ordinance No. 3 requires that a M2 performance assessment be conducted every three years. To date there have been two prior performance assessments and the most recent assessment reviewed the time period of July 1, 2012 through June 30, 2015. The final report and findings were presented to the Board on August 8, 2016 for approval. Overall, the FY 2012-13 through FY 2014-15 assessment commends OCTA's commitment to the effective and efficient management and delivery of the M2 Program. While there were no significant findings, recommendations for improvements were made. A total of nine recommendations were identified and staff has been working to address and close out all recommendations. As planned, staff is on track to bring a closeout item to the Board in September.

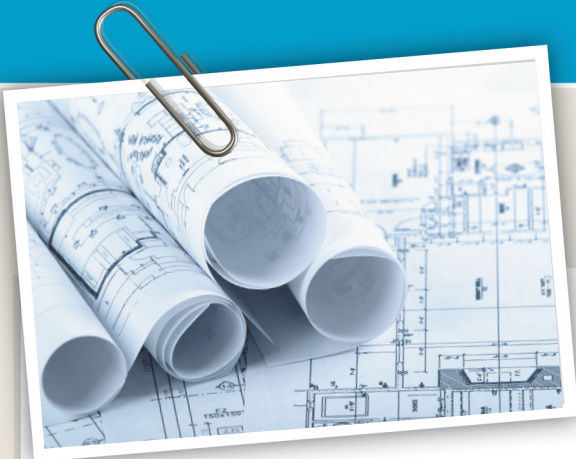
M2 Awareness and Signage

M2 Signage Guidelines are being developed in response to Performance Assessment findings regarding M2 awareness and public perception. These uniform guidelines will document signage procedures to follow for each of the M2 programs (Freeway, Streets & Roads, Transit, and Environmental projects) and will be designed to create a common brand across all modes. The effort was stalled due to concern over the continued use of Measure M in Orange County. With the passage of LA Metro's "Measure M" staff shared with the Board that a proposal will be brought forward to change the measure's logo. With the most common and visible use of the Measure M logo being on freeway funding signs and local street funding signs, staff has been working on some concepts. An initial concept is scheduled to be brought to the Legislative and Communications Committee and the Board in July for discussion.

Measure M2

Progress Report

PROGRAM MGMT



PMO continued from previous page...

OCTA Monitoring Structure for Federal Compliance

As a recipient and a “passed-through” agency of FTA and FHWA funding, OCTA is responsible for complying with agreements and regulations. Involved in agency-wide coordination and ensuring compliance with M2, the PMO has taken the lead in this effort. In June, OCTA selected Sjoberg Evashenk, Inc. to conduct a review of OCTA’s monitoring structure for federal compliance. Though not required of M2, this evaluation is important to M2 projects and programs that are funded with federal monies, ensuring compliance requirements are met and internal protocols are completed efficiently. In the coming months, the consultant will conduct onsite visits, an analysis of OCTA’s structure, and a peer review of similar agencies. The goal is to determine a preferred structure that works in OCTA’s environment.

M2 Administrative Cost Safeguards

M2 includes a one percent cap on administrative expenses for salaries and benefits of OCTA administrative staff on an annual basis. In a legal opinion on M2, it was determined that in years where administrative salaries and benefits are above one percent, only one percent can be allocated with the difference borrowed from other, non-Measure M fund sources. Conversely, in years where administrative salaries and benefits are below one percent, OCTA can still allocate the full one percent for administrative salaries and benefits but may use the unused portion to repay the amount borrowed from prior years in which administrative salaries and benefits were above one percent.

Based on the original M2 revenue projections, OCTA expected to receive \$24.3 billion in M2 funds, with one percent of total revenues available to fund administrative salaries and benefits over the life of the program. As M2 revenue projections declined (currently projected to be 41.6 percent) as a result of economic conditions, the funds available to support administrative salaries and benefits have also declined from the original expectations. While revenue has declined, the administrative effort needed to deliver M2 remains the same. Additionally, the initiation of the Early Action Plan (EAP) in 2007 required administrative functions four years prior to revenue collection. While the EAP resulted in project savings and significant acceleration of the program, administrative functions were required during this time with associated administrative costs.

As a result of the aforementioned factors, OCTA has incurred higher than one percent administrative costs. OCTA currently has Board approval to use funds from the Orange County Unified Transportation Trust (OCUTT) fund to cover costs above the one percent, with the understanding that those funds will be repaid with interest in future years that OCTA administrative costs fall below the one percent cap. As of June 30, 2012, OCTA had borrowed approximately \$5.2 million from OCUTT. Over the last few years, OCTA has experienced underruns in the one percent administration cap and has made payments to OCUTT to reduce the outstanding balance. As of the most recent March 2017 Taxpayer Oversight Committee Report, the outstanding balance was \$2.2 million.

Staff continues to meet quarterly to review all labor costs to ensure proper cost allocation under M2. During the quarter, Staff met on July 19, 2017, to review labor reports for this quarter to ensure costs attributed to the one percent cap were accurately reported and there were no misplaced project related costs, as well as to ensure project costs were applied to the correct projects. Staff will meet again on May 4, 2017, to conduct this quarterly review.

Measure M2

Progress Report

PROGRAM MGMT



PMO continued from previous page...

Taxpayer Oversight Committee

The M2 Ordinance requires a Taxpayer Oversight Committee (TOC) to oversee the implementation of the M2 plan. With the exception of the elected Auditor/Controller of Orange County who in Ordinance No. 3 is identified as the chair of the TOC, all other members are not elected or appointed officials. Members are recruited and screened for expertise and experience by the Orange County Grand Jurors Association, and are selected from the qualified pool by lottery. The TOC meets every other month. The TOC upholds the integrity of the measure by monitoring the use of Measure M funds and ensuring that all revenue collected from Measure M is spent on voter-approved transportation projects. The responsibilities of the 11-member Measure M TOC are to:

- Ensure all transportation revenue collected from Measure M is spent on the projects approved by the voters as part of the plan
- Ratify any changes in the plan and recommend any major changes go back to the voters for approval
- Participate in ensuring that all jurisdictions in Orange County conform with the requirements of Measure M before receipt of any tax monies for local projects
- Hold annual public meetings regarding the expenditure and status of funds generated by Measure M
- Review independent audits of issues regarding the plan and performance of the Orange County local Transportation Authority regarding the expenditure of Measure M sales tax monies
- Annually certify whether Measure M funds have been spent in compliance with the plan.

Two subcommittees have been formed to assist the TOC with their safeguard responsibilities: the Annual Eligibility Review (AER) Subcommittee and the Audit Subcommittee. The AER Subcommittee meets a few times per year, as needed, to ensure local jurisdictions have submitted the following documents in order to be deemed eligible to receive M2 funding: Congestion Management Program, Mitigation Fee Program, Local Traffic Signal Synchronization Plan, Pavement Management Plan, and an Expenditure Report. The Audit Subcommittee meets bi-monthly and is responsible for reviewing the quarterly M2 Revenue and Expenditure Reports and the Annual Measure M Audit, as well as any other items related to Measure M audits.

The TOC met on April 11, 2017 to hold its annual Measure M public hearing, vote on the Measure M Compliance Findings and Local Jurisdictions Eligibility Findings, and hear updates on the Regional Traffic Signal Synchronization Program and the Environmental Cleanup Program. The committee unanimously found that OCTA is proceeding in accordance with the M2 Transportation Ordinance and Investment Plan, and that Measure M is being delivered as promised to voters for the 26th consecutive year.

The TOC also met on June 13, 2017 to receive updated financial information on the M2 Quarterly Revenue & Expenditure Report (Mar. 17) and hear program/project updates on the Project V Community-Based Transit Circulators Program, Comprehensive Transportation Funding Programs, OC Streetcar, and Measure M2 Quarterly Progress Report. OCTA staff also provided the committee with updated information on funding for the I-405 Improvement Project.



M2 Financing and Schedule of Funding

Contact: Sean Murdock, Finance
(714) 560-5685

Revenue Forecast and Collection

OCTA contracts with three universities (Chapman University; University of California, Los Angeles; and California State University, Fullerton) to provide a long-range forecast of taxable sales to forecast Measure M2 revenues for purposes of planning projects and program expenditures. In the past, OCTA has taken an average of the three university taxable sales projections to develop a long-range forecast of Measure M2 taxable sales. On March 28, 2016, as part of the FY 2016-17 budget development process, the Board approved a new sales tax forecast methodology. This methodology includes a more conservative approach by utilizing a five-year forecast from MuniServices, Inc. Historically, MuniServices, Inc. has been more conservative than the three universities over the first five years of M2 revenue collection (2011-2016).

Revenue forecast information is updated quarterly based on the actual revenues received for the previous quarter. As required by law, OCTA pays the State Board of Equalization a fee to collect the sales tax. The M2 Ordinance estimated this fee to be 1.5 percent of the revenues collected over the life of the program.

Current Forecast

Based on long term forecasts received in July 2016, OCTA staff forecasts total nominal sales tax collections over the life of M2 to be approximately \$14.2 billion. Original projections in 2005 estimated total nominal M2 sales tax collections at \$24.3 billion. Based on the current estimated forecast of \$14.2 billion, sales tax revenue will run approximately \$10.1 billion (41.6 percent) less than the original 2005 projection. The revenue forecast for the life of the M2 Program will vary as actual sales tax revenue data is incorporated.

Final sales tax receipts through the third quarter of fiscal year 2016-17 (March 31, 2017) were received in June 2017, and reflected a growth in sales tax revenue of 2.29 percent over the same period of the prior fiscal year. The growth, while positive, is less than the budgeted sales tax growth rate of 4.4 percent for fiscal year 2016-17. In addition, Staff is currently evaluating the impact of this year's updated forecasts while waiting for final fourth quarter receipts. It is anticipated that the result of the updated forecasts will result in a change to the current M2 program sales tax revenue estimate of \$14.2 billion. Staff will be providing the Finance and Administration Committee as well as the Board an update on sales tax in the first quarter of fiscal year 2017-18.

Measure M2

Progress Report

PROGRAM MGMT



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Measure M2

Progress Report

REVENUE & EXPENDITURES



Schedule 1

Measure M2

Schedule of Revenues, Expenditures and Changes in Fund Balance

as of June 30, 2017

(Unaudited)

(\$ in thousands)	Quarter Ended June 30, 2017	Year to Date June 30, 2017 (A)	Period from Inception to June 30, 2017 (B)
Revenues:			
Sales taxes	\$ 79,173	\$ 309,861	\$ 1,760,170
Other agencies' share of Measure M2 costs:			
Project related	19,205	76,224	552,419
Non-project related	(34)	15	454
Interest:			
Operating:			
Project related	91	126	128
Non-project related	(303)	4,840	21,922
Bond proceeds	-	6,482	42,479
Debt service	16	47	123
Commercial paper	-	-	393
Right-of-way leases	10	93	907
Proceeds on sale of assets held for resale	-	6,804	6,804
Miscellaneous:			
Project related	-	-	270
Non-project related	-	-	100
Total revenues	98,158	404,492	2,386,169
Expenditures:			
Supplies and services:			
State Board of Equalization (SBOE) fees	903	3,603	19,491
Professional services:			
Project related	16,809	38,509	311,358
Non-project related	673	1,890	16,933
Administration costs:			
Project related	1,725	7,997	52,537
Non-project related :			
Salaries and Benefits	591	2,365	19,805
Other	1,170	4,679	31,317
Other:			
Project related	45	3,171	4,849
Non-project related	69	92	3,892
Payments to local agencies:			
Project related	30,065	120,976	728,872
Capital outlay:			
Project related	57,394	86,876	633,369
Non-project related	-	-	31
Debt service:			
Principal payments on long-term debt	-	7,475	34,560
Interest on long-term debt and commercial paper	6	21,342	136,879
Total expenditures	109,450	298,975	1,993,893
Excess (deficiency) of revenues over (under) expenditures	(11,292)	105,517	392,276
Other financing sources (uses):			
Transfers out:			
Project related	(2,792)	(6,972)	(29,631)
Transfers in:			
Project related	-	3,964	79,508
Non-project related	-	(3,964)	1,973
Bond proceeds	-	-	358,593
Total other financing sources (uses)	(2,792)	(6,972)	410,443
Excess (deficiency) of revenues over (under) expenditures and other sources (uses)	\$ (14,084)	\$ 98,545	\$ 802,719



Schedule 2

Measure M2
Schedule of Calculations of Net Revenues and Net Bond Revenues (Debt Service)
as of June 30, 2017
(Unaudited)

(\$ in thousands)	Quarter Ended June 30, 2017 (actual)	Year to Date June 30, 2017 (actual) (C.1)	Period from Inception through June 30, 2017 (actual) (D.1)	Period from July 1, 2017 through March 31, 2041 (forecast) (E.1)	Total (F.1)
Revenues:					
Sales taxes	\$ 79,173	\$ 309,861	\$ 1,760,170	\$ 12,402,132	\$ 14,162,302
Operating interest	(303)	4,840	21,922	201,484	223,406
Subtotal	<u>78,870</u>	<u>314,701</u>	<u>1,782,092</u>	<u>12,603,616</u>	<u>14,385,708</u>
Other agencies share of M2 costs	(34)	15	454	-	454
Miscellaneous	-	-	100	-	100
Total revenues	<u>78,836</u>	<u>314,716</u>	<u>1,782,646</u>	<u>12,603,616</u>	<u>14,386,262</u>
Administrative expenditures:					
SBOE fees	903	3,603	19,491	186,107	205,598
Professional services	673	1,890	13,157	84,985	98,142
Administration costs :					
Salaries and Benefits	591	2,365	19,805	124,001	143,806
Other	1,170	4,679	31,317	214,025	245,342
Other	69	92	3,892	21,385	25,277
Capital outlay	-	-	31	-	31
Environmental cleanup	2,422	10,095	28,245	248,003	276,248
Total expenditures	<u>7,553</u>	<u>22,724</u>	<u>115,938</u>	<u>878,506</u>	<u>994,444</u>
Net revenues	<u>\$ 71,283</u>	<u>\$ 291,992</u>	<u>\$ 1,666,708</u>	<u>\$ 11,725,110</u>	<u>\$ 13,391,818</u>
		(C.2)	(D.2)	(E.2)	(F.2)
Bond revenues:					
Proceeds from issuance of bonds	\$ -	\$ -	\$ 358,593	\$ 1,450,000	\$ 1,808,593
Interest revenue from bond proceeds	-	6,482	42,479	6,405	48,884
Interest revenue from debt service funds	16	47	123	3,874	3,997
Interest revenue from commercial paper	-	-	393	-	393
Total bond revenues	<u>16</u>	<u>6,529</u>	<u>401,588</u>	<u>1,460,279</u>	<u>1,861,867</u>
Financing expenditures and uses:					
Professional services	-	-	3,776	12,340	16,116
Bond debt principal	-	7,475	34,560	1,768,010	1,802,570
Bond debt and other interest expense	6	21,342	136,879	877,953	1,014,832
Total financing expenditures and uses	<u>6</u>	<u>28,817</u>	<u>175,215</u>	<u>2,658,303</u>	<u>2,833,518</u>
Net bond revenues (debt service)	<u>\$ 10</u>	<u>\$ (22,288)</u>	<u>\$ 226,373</u>	<u>\$ (1,198,024)</u>	<u>\$ (971,651)</u>

Measure M2

Progress Report

REVENUE & EXPENDITURES



Measure M2
Schedule of Revenues and Expenditures Summary
as of June 30, 2017
(Unaudited)

Schedule 3

Project	Description	Net Revenues through June 30, 2017	Total Net Revenues
	(G)	(H)	(I)
	(\$ in thousands)		
Freeways (43% of Net Revenues)			
A	I-5 Santa Ana Freeway Interchange Improvements	\$ 65,693	\$ 527,840
B	I-5 Santa Ana/SR-55 to El Toro	41,960	337,144
C	I-5 San Diego/South of El Toro	87,639	704,161
D	I-5 Santa Ana/San Diego Interchange Upgrades	36,062	289,751
E	SR-22 Garden Grove Freeway Access Improvements	16,773	134,768
F	SR-55 Costa Mesa Freeway Improvements	51,157	411,041
G	SR-57 Orange Freeway Improvements	36,159	290,537
H	SR-91 Improvements from I-5 to SR-57	19,568	157,229
I	SR-91 Improvements from SR-57 to SR-55	58,216	467,756
J	SR-91 Improvements from SR-55 to County Line	49,228	395,543
K	I-405 Improvements between I-605 to SR-55	149,949	1,204,823
L	I-405 Improvements between SR-55 to I-5	44,686	359,044
M	I-605 Freeway Access Improvements	2,795	22,461
N	All Freeway Service Patrol	20,966	168,460
	Freeway Mitigation	35,834	287,924
	Subtotal Projects	716,685	5,758,482
	Net (Bond Revenue)/Debt Service	-	-
	Total Freeways	\$ 716,685	\$ 5,758,482
	%		

Street and Roads Projects (32% of Net Revenues)

O	Regional Capacity Program	\$ 166,673	\$ 1,339,199
P	Regional Traffic Signal Synchronization Program	66,666	535,656
Q	Local Fair Share Program	300,007	2,410,527
	Subtotal Projects	533,346	4,285,382
	Net (Bond Revenue)/Debt Service	-	-
	Total Street and Roads Projects	\$ 533,346	\$ 4,285,382
	%		

Measure M2

Progress Report

REVENUE & EXPENDITURES



Measure M2
Schedule of Revenues and Expenditures Summary
as of June 30, 2017
(Unaudited)

Schedule 3

Expenditures through June 30, 2017 (J)	Reimbursements through June 30, 2017 (K)	Net M2 Cost (L)
\$ 5,890	\$ 1,930	\$ 3,960
6,784	4,194	2,590
101,531	40,708	60,823
1,819	527	1,292
4	-	4
9,010	23	8,987
46,081	10,820	35,261
33,488	824	32,664
18,860	2,262	16,598
6,947	5,294	1,653
120,513	8,211	112,302
7,471	4,893	2,578
1,310	16	1,294
289	-	289
48,901	1,800	47,101
408,898	81,502	327,396
35,748	-	35,748
\$ 444,646	\$ 81,502	\$ 363,144
		30.5%
\$ 666,925	\$ 393,652	\$ 273,273
35,963	4,879	31,084
289,873	77	289,796
992,761	398,608	594,153
39,706	-	39,706
\$ 1,032,467	\$ 398,608	\$ 633,859
		53.3%

Continues on following page...

Measure M2

Progress Report

REVENUE & EXPENDITURES



Measure M2 Schedule of Revenues and Expenditures Summary as of June 30, 2017 (Unaudited)

Schedule 3

Project	Description	Revenues through June 30, 2017	Total Revenues
	(G)	(H.1)	(I.1)
	(\$ in thousands)		
Transit Projects (25% of Net Revenues)			
R	High Frequency Metrolink Service	\$ 153,641	\$ 1,335,635
S	Transit Extensions to Metrolink	147,132	1,182,187
T	Metrolink Gateways	26,874	68,449
U	Expand Mobility Choices for Seniors and Persons with Disabilities	52,027	464,363
V	Community Based Transit/Circulators	33,325	267,765
W	Safe Transit Stops	3,678	29,555
	Subtotal Projects	416,677	3,347,954
	Net (Bond Revenue)/Debt Service	-	-
	Total Transit Projects	\$ 416,677	\$ 3,347,954
	%		
Measure M2 Program			
		\$ 1,666,708	\$ 13,391,818
Environmental Cleanup (2% of Revenues)			
X	Clean Up Highway and Street Runoff that Pollutes Beaches	\$ 35,642	\$ 287,714
	Net (Bond Revenue)/Debt Service	-	-
	Total Environmental Cleanup	\$ 35,642	\$ 287,714
	%		
Taxpayer Safeguards and Audits			
	Collect Sales Taxes (1.5% of Sales Taxes)	\$ 26,403	\$ 212,435
	%		
	Oversight and Annual Audits (1% of Revenues)	\$ 17,821	\$ 143,857
	%		

Measure M2

Progress Report

REVENUE & EXPENDITURES



Measure M2 Schedule of Revenues and Expenditures Summary as of June 30, 2017 (Unaudited)

Schedule 3

Expenditures through June 30, 2017 (J)	Reimbursements through June 30, 2017 (K)	Net M2 Cost (L)
\$ 164,643	\$ 96,087	\$ 68,556
13,496	2,133	11,363
98,214	60,956	37,258
50,151	88	50,063
3,963	344	3,619
245	26	219
330,712	159,634	171,078
22,206	-	22,206
\$ 352,918	\$ 159,634	\$ 193,284
		16.2%
\$ 1,830,031	\$ 639,744	\$ 1,190,287
\$ 28,245	\$ 292	\$ 27,953
-	-	-
\$ 28,245	\$ 292	\$ 27,953
		1.6%
\$ 19,491	\$ -	\$ 19,491
		1.1%
\$ 19,805	\$ 1,984	\$ 17,821
		1.0%

Measure M2

Progress Report LOCAL FAIR SHARE



M2 Funds		
ENTITY	4rd Quarter FY 2016/17	FUNDS TO DATE
ALISO VIEJO	\$210,063.10	\$3,592,390.11
ANAHEIM	\$1,881,872.38	\$31,224,189.23
BREA	\$305,081.95	\$5,222,178.34
BUENA PARK	\$454,349.44	\$8,309,398.54
COSTA MESA	\$791,159.43	\$13,146,979.86
CYPRESS	\$282,176.34	\$4,870,374.15
DANA POINT	\$171,162.00	\$2,969,584.94
FOUNTAIN VALLEY	\$328,157.77	\$5,684,114.15
FULLERTON	\$694,570.73	\$11,839,316.44
GARDEN GROVE	\$797,836.61	\$13,567,769.95
HUNTINGTON BEACH	\$1,030,145.94	\$17,662,292.84
IRVINE	\$1,480,625.19	\$24,023,636.60
LAGUNA BEACH	\$137,753.90	\$2,315,973.72
LAGUNA HILLS	\$180,408.88	\$3,103,390.76
LAGUNA NIGUEL	\$355,386.38	\$6,102,954.30
LAGUNA WOODS	\$67,060.48	\$1,169,643.01
LA HABRA	\$278,472.54	\$4,817,293.96
LAKE FOREST	\$429,950.82	\$7,140,261.41

Measure M2

Progress Report

LOCAL FAIR SHARE



ENTITY	4rd Quarter FY 2016/17	FUNDS TO DATE
LA PALMA	\$81,511.63	\$1,561,485.79
LOS ALAMITOS	\$69,593.41	\$1,179,457.45
MISSION VIEJO	\$500,709.78	\$8,542,631.72
NEWPORT BEACH	\$587,822.34	\$9,994,461.39
ORANGE	\$890,339.72	\$14,961,878.54
PLACENTIA	\$256,355.40	\$4,322,357.30
RANCHO SANTA MARGARITA	\$225,311.30	\$3,862,143.28
SAN CLEMENTE	\$302,333.48	\$5,065,474.82
SAN JUAN CAPISTRANO	\$200,011.64	\$3,456,680.05
SANTA ANA	\$1,504,041.27	\$25,255,335.61
SEAL BEACH	\$129,707.58	\$2,324,301.00
STANTON	\$160,268.84	\$2,742,325.77
TUSTIN	\$485,994.81	\$8,086,756.01
VILLA PARK	\$28,075.05	\$475,098.67
WESTMINSTER	\$461,125.86	\$7,780,997.70
YORBA LINDA	\$322,004.93	\$5,455,253.92
COUNTY UNINCORPORATED	\$1,020,181.48	\$16,719,785.92
TOTAL M2 FUNDS	\$17,101,622.40	\$288,548,167.25

Measure M2

Progress Report

CAPITAL ACTION PLAN



Grey = Milestone achieved

Green = Forecast milestone meets or exceeds plan

Yellow = Forecast milestone is one to three months later than plan

Red = Forecast milestone is over three months later than plan

Capital Projects*	Cost Budget/ Forecast (in millions)	Schedule Plan/Forecast			
		Begin Environmental	Complete Environmental	Complete Design	Complete Construction
FREEWAY PROJECTS					
I-5, SR-55 to SR-57	\$37.1	Jul-11	Jun-13	Mar-17	Feb-20
Project A	\$39.6	Jun-11	Apr-15	Oct-17	Jun-20
I-5, I-405 to SR-55	TBD	May-14	Aug-18	TBD	TBD
Project B	TBD	May-14	Oct-18	TBD	TBD
I-5, Avenida Pico to Avenida Vista Hermosa	\$113.0	Jun-09	Dec-11	Oct-13	Aug-18
Project C	\$89.5	Jun-09	Oct-11	Oct-13	May-18
I-5, Avenida Vista Hermosa to Pacific Coast Highway	\$75.6	Jun-09	Dec-11	Feb-13	Mar-17
Project C	\$71.4	Jun-09	Oct-11	May-13	Jul-17
I-5, Pacific Coast Highway to San Juan Creek Road	\$70.7	Jun-09	Dec-11	Jan-13	Sep-16
Project C	\$71.2	Jun-09	Oct-11	Jan-13	Apr-18
I-5, Ortega Interchange	\$90.9	Sep-05	Jun-09	Nov-11	Sep-15
Project D	\$75.1	Sep-05	Jun-09	Dec-11	Jan-16
I-5, Ortega Interchange (Landscape)	N/A	N/A	N/A	N/A	N/A
Project D	N/A	N/A	N/A	Oct-14	Sep-16
I-5, SR-73 to Oso Parkway	\$151.9	Sep-11	Jun-14	Jan-18	Apr-22
Project C & D	\$190.5	Oct-11	May-14	Jan-19	Sep-24
I-5, Oso Parkway to Alicia Parkway	\$196.2	Sep-11	Jun-14	Jun-17	Mar-22
Project C & D	\$191.0	Oct-11	May-14	May-18	Jul-23
I-5, Alicia Parkway to El Toro Road	\$133.6	Sep-11	Jun-14	Jun-18	Sep-22
Project C	\$166.5	Oct-11	May-14	May-19	Dec-23
I-5, El Toro Road Interchange	TBD	TBD	TBD	TBD	TBD
Project D	TBD	May-17	Apr-20	TBD	TBD

*For detailed project information, please refer to the individual project section within this report.

Measure M2

Progress Report

CAPITAL ACTION PLAN



Grey = Milestone achieved

Green = Forecast milestone meets or exceeds plan

Yellow = Forecast milestone is one to three months later than plan

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Capital Projects*	Cost Budget/ Forecast (in millions)	Schedule Plan/Forecast			
		Begin Environmental	Complete Environmental	Complete Design	Complete Construction
SR-55, I-405 to I-5	TBD	Feb-11	Nov-13	TBD	TBD
Project F	\$410.9	May-11	Sep-17	Nov-20	Jun-25
SR-55, I-5 to SR-91	TBD	Dec-16	Jan-20	TBD	TBD
Project F	TBD	Dec-16	Jan-20	TBD	TBD
SR-57 Northbound (NB), Orangewood Avenue to Katella Avenue	TBD	Apr-16	Dec-18	TBD	TBD
Project G	\$0.0	Apr-16	Dec-18	TBD	TBD
SR-57 (NB), Katella Avenue to Lincoln Avenue	\$78.7	Apr-08	Jul-09	Nov-10	Sep-14
Project G	\$40.5	Apr-08	Nov-09	Dec-10	Apr-15
SR-57 (NB), Katella Avenue to Lincoln Avenue (Landscape)	N/A	N/A	N/A	N/A	N/A
Project G	N/A	N/A	N/A	Jul-10	Nov-18
SR-57 (NB), Orangethorpe Avenue to Yorba Linda Boulevard	\$80.2	Aug-05	Dec-07	Dec-09	May-14
Project G	\$52.6	Aug-05	Dec-07	Jul-09	Nov-14
SR-57 (NB), Yorba Linda Boulevard to Lambert Road	\$79.3	Aug-05	Dec-07	Dec-09	Sep-14
Project G	\$55.4	Aug-05	Dec-07	Jul-09	May-14
SR-57 (NB), Orangethorpe Avenue to Lambert Road (Landscape)	N/A	N/A	N/A	N/A	N/A
Project G	N/A	N/A	N/A	Nov-17	May-19
SR-57 (NB), Lambert Road to Tonner Canyon	TBD	TBD	TBD	TBD	TBD
Project G	TBD	Aug-18	Jul-21	TBD	TBD
SR-91 Westbound (WB), I-5 to SR-57	\$78.1	Jul-07	Apr-10	Feb-12	Apr-16
Project H	\$59.6	Jul-07	Jun-10	Apr-12	Jun-16
SR-91 Westbound (WB), I-5 to SR-57 (Landscape)	N/A	N/A	N/A	N/A	N/A
Project H	N/A	N/A	N/A	Aug-16	May-18

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Capital Projects*	Cost Budget/ Forecast (in millions)	Schedule Plan/Forecast			
		Begin Environmental	Complete Environmental	Complete Design	Complete Construction
SR-91, SR-57 to SR-55	TBD	Jan-15	Oct-18	TBD	TBD
Project I	TBD	Jan-15	May-19	TBD	TBD
SR-91 (WB), Tustin Interchange to SR-55	\$49.9	Jul-08	Jul-11	Mar-13	Jul-16
Project I	\$43.3	Jul-08	May-11	Feb-13	Jul-16
SR-91, SR-55 to SR-241	\$128.4	Jul-07	Jul-09	Jan-11	Dec-12
Project J	\$79.6	Jul-07	Apr-09	Aug-10	Mar-13
SR-91, SR-55 to SR-241 (Landscape)	N/A	N/A	N/A	N/A	N/A
Project J	N/A	N/A	N/A	Feb-13	Feb-15
SR-91 Eastbound, SR-241 to SR-71	\$104.5	Mar-05	Dec-07	Dec-08	Nov-10
Project J	\$57.8	Mar-05	Dec-07	Dec-08	Jan-11
I-405, SR-55 to I-605 (Design-Build)	\$1,900.0	Mar-09	Mar-13	Nov-15	Apr-23
Project K	\$1,900.0	Mar-09	May-15	Nov-15	May-23
I-405, I-5 to SR-55	TBD	Dec-14	Jul-18	TBD	TBD
Project L	TBD	Dec-14	Jul-18	TBD	TBD
I-605, I-605/Katella Interchange	TBD	Aug-16	Nov-18	TBD	TBD
Project M	TBD	Aug-16	Nov-18	TBD	TBD
GRADE SEPARATION PROJECTS					
Sand Canyon Avenue Railroad Grade Separation	\$55.6	N/A	Sep-03	Jul-10	May-14
Project R	\$61.8	N/A	Sep-03	Jul-10	Jan-16
Raymond Avenue Railroad Grade Separation	\$77.2	Feb-09	Nov-09	Aug-12	Aug-18
Project O	\$124.8	Feb-09	Nov-09	Dec-12	Aug-18
State College Boulevard Railroad Grade Separation (Fullerton)	\$73.6	Dec-08	Jan-11	Aug-12	May-18
Project O	\$97.0	Dec-08	Apr-11	Feb-13	Jan-18

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Capital Projects*	Cost Budget/ Forecast (in millions)	Schedule Plan/Forecast			
		Begin Environmental	Complete Environmental	Complete Design	Complete Construction
Placentia Avenue Railroad Grade Separation	\$78.2	Jan-01	May-01	Mar-10	Nov-14
Project O	\$64.6	Jan-01	May-01	Jun-10	Dec-14
Kraemer Boulevard Railroad Grade Separation	\$70.4	Jan-01	Sep-09	Jul-10	Oct-14
Project O	\$63.5	Jan-01	Sep-09	Jul-10	Dec-14
Orangethorpe Avenue Railroad Grade Separation	\$117.4	Jan-01	Sep-09	Dec-11	Sep-16
Project O	\$108.6	Jan-01	Sep-09	Oct-11	Oct-16
Tustin Avenue/Rose Drive Railroad Grade Separation	\$103.0	Jan-01	Sep-09	Dec-11	May-16
Project O	\$98.3	Jan-01	Sep-09	Jul-11	Oct-16
Lakeview Avenue Railroad Grade Separation	\$70.2	Jan-01	Sep-09	Oct-11	Mar-17
Project O	\$107.4	Jan-01	Sep-09	Jan-13	Jun-17
17th Street Railroad Grade Separation	TBD	Oct-14	Jun-16	TBD	TBD
Project R	TBD	Oct-14	Oct-17	TBD	TBD
RAIL AND STATION PROJECTS					
Rail-Highway Grade Crossing Safety Enhancement	\$94.4	Jan-08	Oct-08	Sep-08	Dec-11
Project R	\$90.4	Jan-08	Oct-08	Sep-08	Dec-11
San Clemente Beach Trail Safety Enhancements	\$6.0	Sep-10	Jul-11	Apr-12	Jan-14
Project R	\$5.0	Sep-10	Jul-11	Jun-12	Mar-14
San Juan Capistrano Passing Siding	\$25.3	Aug-11	Jan-13	May-16	Jan-19
	\$30.8	Aug-11	Mar-14	Dec-17	Aug-20
OC Streetcar	\$309.0	Aug-09	Mar-12	Sep-17	Apr-20
Project S	\$310.4	Aug-09	Mar-15	Sep-17	Jul-20
Placentia Metrolink Station and Parking Structure	\$34.8	Jan-03	May-07	Jan-11	TBD
Project R	\$34.8	Jan-03	May-07	Feb-11	Oct-19

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Capital Projects*	Cost Budget/ Forecast (in millions)	Schedule Plan/Forecast			
		Begin Environmental	Complete Environmental	Complete Design	Complete Construction
Anaheim Canyon Station	\$27.9	Jan-16	Dec-16	TBD	TBD
	\$27.9	Jan-16	Jun-17	Apr-19	Dec-20
Orange Station Parking Expansion	\$33.2	Dec-09	Dec-12	Apr-13	Jun-18
	\$32.3	Dec-09	May-16	Apr-16	Jan-19
Fullerton Transportation Center - Elevator Upgrades	\$3.5	N/A	N/A	Dec-13	Mar-17
	\$4.0	N/A	N/A	Dec-13	Sep-18
Laguna Niguel/Mission Viejo Station ADA Ramps	\$3.5	Jul-13	Jan-14	Aug-14	Apr-17
	\$5.1	Jul-13	Feb-14	Jul-15	Oct-17
Anaheim Regional Transportation Intermodal Center	\$227.4	Apr-09	Feb-11	Feb-12	Nov-14
	\$230.4	Apr-09	Feb-12	May-12	Dec-14

*For detailed project information, please refer to the individual project section within this report.

LOS ANGELES

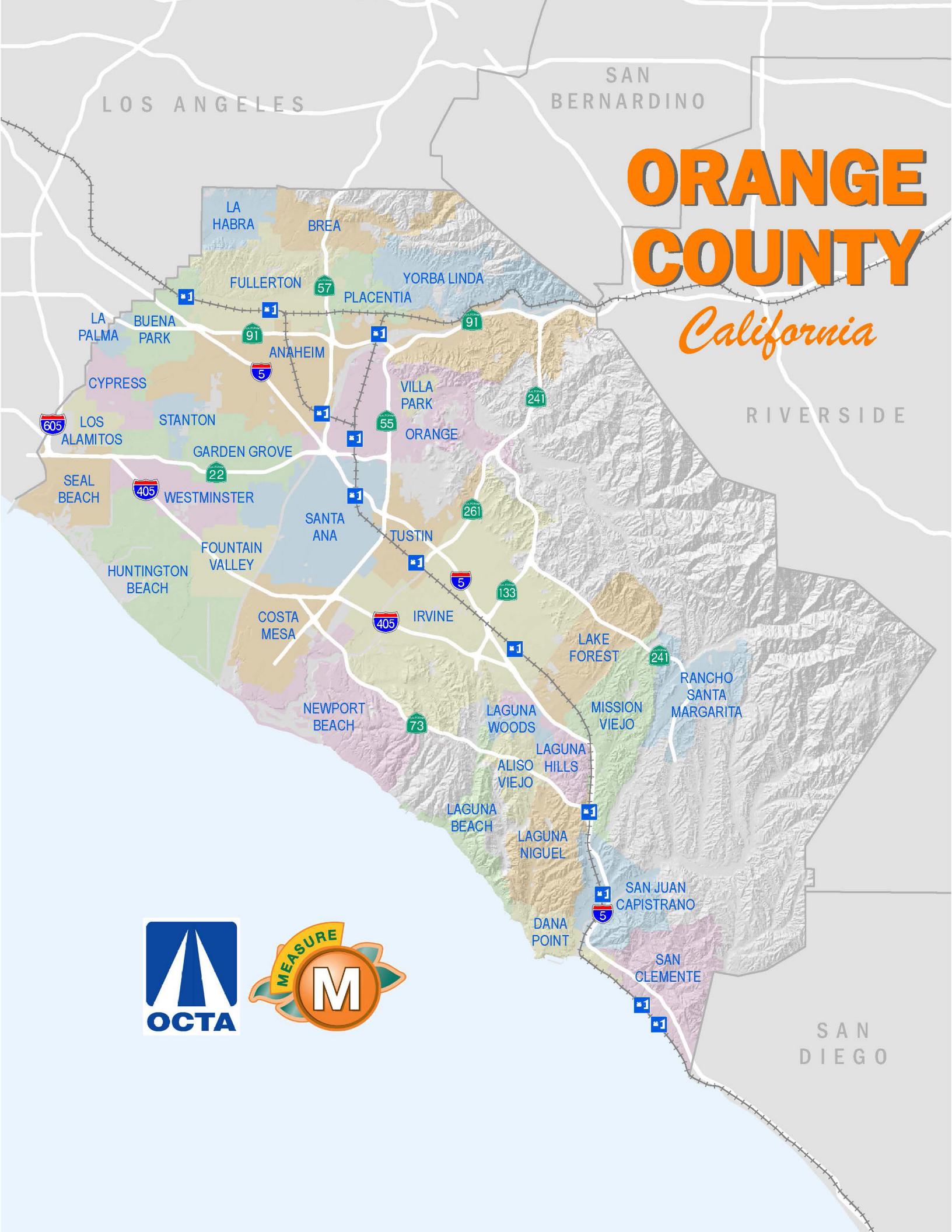
SAN BERNARDINO

ORANGE COUNTY

California


RIVERSIDE

SAN DIEGO





September 7, 2017

To: Executive Committee
From: Darrell Johnson, Chief Executive Officer 
Subject: Measure M2 Performance Assessment Report Update

Overview

Measure M2 includes a requirement for a performance assessment to be conducted every three years to evaluate the efficiency, effectiveness, economy, and program results of the Orange County Transportation Authority in delivering Measure M2. The third of these performance assessments, covering the period of July 1, 2012 through June 30, 2015, was completed and presented to the Board of Directors on August 8, 2016. This report is the final update on the action items from the findings in the performance assessment.

Recommendation

Receive and file as an information item.

Background

On November 7, 2006, the voters of Orange County approved the Measure M2 (M2) Transportation Investment Plan (Plan) with a 69.7 percent vote. The Plan provides a revenue stream, from April 1, 2011 through March 30, 2041, to fund a broad range of transportation improvements. The M2 Ordinance specifies specific safeguards and requirements that are to be followed.

Ordinance No. 3 states: "A performance assessment shall be conducted at least once every three years to evaluate the efficiency, effectiveness, economy, and program results of the Authority in satisfying the provisions and requirements of the investment summary of the Plan, the Plan, and the ordinance."

The third triennial performance assessment, covering the time period of July 1, 2012 through June 30, 2015, was presented to the Orange County Transportation Authority (OCTA) Board of Directors (Board) on August 8, 2016, as well as to the Taxpayers Oversight Committee on June 14, 2016.

The performance assessment included nine findings, and staff provided the Board with an action plan to implement in response to the findings, with a commitment to be completed by the end of the 2017 calendar year.

Discussion

The key objectives of the third assessment were as follows: to evaluate the status of findings from the second M2 performance assessment and the effectiveness of changes implemented, assess the performance of OCTA on the efficient delivery of M2 projects and programs, and identify and evaluate any potential barriers to success, including opportunities for process improvements.

Overall, the fiscal year (FY) 2012-13 through FY 2014-15 assessment commended OCTA's commitment to the effective and efficient management and delivery of the M2 Program. In general, the assessment report found that OCTA has made significant progress in the implementation of the M2 Program on all plan elements over the last three years.

As part of the report, there were nine findings related to the execution of the elements outlined in the scope of work. The findings either commented on appropriateness of actions to date or provided recommendations for improvements. There were no major recommendations that suggested there should be a change in the direction of OCTA's actions.

Below are the key areas the recommendations focused on, along with a summary of the action that staff has implemented.

- To ensure successful freeway program delivery, the assessment identified a need for OCTA and the California Department of Transportation (Caltrans) to work together on a mutually agreed upon freeway delivery schedule. The assessment recommended seeking inclusion of local measure projects in Caltrans annual Contract for Delivery. Caltrans views the Contract for Delivery arrangement as an internal mechanism to ensure timely delivery of state-funded projects and, as such, not the appropriate tool to address delivery of Measure-funded projects. Accordingly, OCTA, neighboring self-help counties, and Caltrans have agreed to work together to create a master agreement demonstrating the commitment of the state to support the delivery of sales tax-funded program of projects.

- The assessment also recommended language should be developed to define “betterments” within freeway project cooperative agreements. Staff has included language related to betterments in the Interstate 405 project cooperative agreement between Caltrans and OCTA. In addition, staff has incorporated a step in the development of cooperative agreements with third party agencies to include a discussion on betterments. When possible, the cooperative agreement will define betterments and what is and is not included in the project scope.
- To continue to engage in discussions increasing awareness of M2, staff has made enhancements to the M website to provide more comprehensive information. Additionally, staff has launched the development of a new identity for M2 to increase awareness of our local sales tax measure. The proposed OC Go logo, as well as cohesive color scheme across all projects and modes within the M Program, is intended to increase awareness and promote a better understanding of how the transportation sales tax measure is put to use.
- To continue to monitor ongoing expenditures for administrative expenses, staff continues to closely monitor the one percent administrative salaries and benefits charges on a quarterly basis and takes corrective action as needed. Additionally, administrative salaries and benefits expenses are reported in the M2 quarterly reports to ensure transparency and management of the one percent cap. This level of ongoing monitoring will continue throughout the life of M2.


A table outlining the overall M2 Performance Assessment findings, as well the completed action, can be found in Attachment A.

Summary

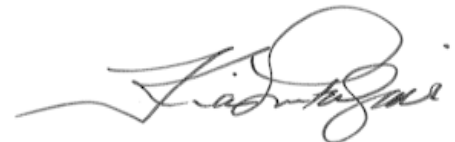
The third Measure M2 Performance Assessment, as required by Ordinance No. 3, was completed and presented to the Board on August 8, 2016. Nine findings/recommendations were made to which staff responded and developed an action plan. Since then, all nine findings have been addressed and completed. A summary of all findings and action items is included in Attachment A.

Attachment

- A. July 2012 – June 2015 Measure M2 Performance Assessment Response to Findings

Prepared by:

Tamara Warren
Manager, Program Management Office
(714) 560-5590

Approved by:

Kia Mortazavi
Executive Director, Planning
(714) 560-5741

July 2012 – June 2015 M2 Performance Assessment Response to Findings

	Summary of Findings/Recommendations	OCTA Action
1.	<p>Conflicts between OCTA's commitment to its constituents and the state's priorities (e.g., greenhouse gas reductions) have led to delays in project definition and environmental processes.</p> <p>Continuing to partner with Caltrans at the technical level for system planning and modeling, and throughout all project phases can identify projects where advance coordination could help mitigate schedule delays while the agencies reconcile goals and objectives.</p> <p>An example of this partnership is for OCTA to work with Caltrans and explore the possibility of including OCTA projects on Caltrans list of approved projects in the fiscal year contract for delivery.</p>	<p>Underway - Staff continues to partner with Caltrans District 12 at all levels during project delivery. To ensure successful freeway program delivery, staff initiated discussions with Caltrans to create a Local Contract for Delivery. Caltrans believes that Contract for Delivery is not suited for this purpose. As a result, neighboring self-help counties and Caltrans agreed to work together to create a master agreement, demonstrating a commitment from both agencies to deliver local measure freeway projects.</p>
2.	<p>Increasing occurrences of changes and/or growth in a project's scope have been issues during the design and development phases. Sometimes, requests for modification to constructed elements were requested during the final Caltrans safety and maintenance walk through.</p> <p>Include language that defines the term "betterment" in project-specific third-party agreements with relevant agencies. Particular agreements may define how betterments will be negotiated, if appropriate.</p>	<p>Complete - Staff included language related to "betterments" in the recently completed I-405 project cooperative agreement between Caltrans and OCTA. Staff has incorporated a step in the development of cooperative agreements with third party agencies to include a discussion on betterments. As appropriate, cooperative agreements will define betterments and what is, and is not, included in the project scope.</p>
3.	<p>The M2 PMO performance has matured and continued to perform at a high degree of professionalism and responsiveness. With the arrival of two new program analysts, OCTA is poised to oversee the growing program more fully, such as with more comprehensive (recently redesigned) quarterly reports and through deeper involvement in project management review and analysis.</p> <p>OCTA should communicate PMO staff member roles and responsibilities, which should define backup and mutual support activities. Clear roles should be communicated across divisions to help promote coordination and communication.</p>	<p>Complete - With the addition of staff, this has allowed the PMO department to expand its role within the organization. The PMO reached out to each of the Executive Directors to seek input on how the department can further assist them in their M2 delivery goals.</p> <p>Additionally, communication with partner agencies has taken place and is ongoing to ensure lessons learned are shared.</p> <p>While PMO staff roles and responsibilities are defined, PMO staff is also cross trained to allow flexibility and respond to fluctuating workflows.</p>

July 2013 – June 2015 M2 Performance Assessment Response to Findings

	OCTA should broaden the PMO by expanding participation with external stakeholder groups, think strategically about building awareness, build stronger relationships with other self-help county partner agencies, and increase collaboration with Caltrans.	
4.	<p>PMO staff have a strong base of skills to administer the M2 Program, including work experience across other OCTA divisions and history dating back to the early days of the PMO. Periodic training could enhance the PMO and key stakeholders, strengthening OCTA commitment to its broad mission.</p> <p>OCTA should implement the program management academy in the short term. Such a program will benefit new staff and strengthen collaboration between the PMO, Finance and Administration Division, and the respective project/program managers. The M2 Ordinance and policy administration strategies should be shared as part of the training. In addition, OCTA should consider project management professional training for all PMO staff.</p>	<p>Underway - The most recent program management academy took place in late 2013 and is designed to be conducted every few years based on need due to staff and/or policy changes. Following discussion with the Executive Directors, the PMO intends to conduct the next academy in spring 2018.</p> <p>The PMO staff continues to look for training opportunities to keep up with current program management techniques and tools. Staff is enrolled in a project management academy course in fall 2017.</p>
5.	OCTA should continue to monitor ongoing expenditures for administrative expenses, including labor charges by project, and determine whether any changes are required in the future.	Ongoing - The PMO and Executive Directors from each of the divisions meet quarterly and review labor charges to ensure that project-specific administrative costs are charged appropriately. Additionally, administrative expenses are reported in the M2 quarterly reports to ensure transparency and management of the one percent administrative cap. This level of ongoing monitoring will continue throughout the life of M2.
6.	<p>OCTA regularly evaluates the optimum level of debt financing and the timing of debt issuance required to deliver the M2 Program in a cost-effective manner. OCTA continues to seek alternate sources of funding to supplement M2 funds when available and has processes in place to periodically update its cash-flow needs for the M2 Program.</p> <p>In addition to evaluating the optimum level of debt to issue and timing of debt issuance to deliver the M2 Program, OCTA should continue efforts to seek alternate sources of funding to supplement M2 funds.</p>	Ongoing - The M2 cash flows are updated annually in response to the ever-changing social, political, economic environment, and most important to ensure the program is financially sustainable to be delivered as promised to the voters of Orange County. Reviewing and reporting on current and future needs for debt financing is part of these updates, along with separate plans of finance taken to the Board for consideration whenever new debt is required. Annual updates are done through the Comprehensive Business Plan updates, as well as through M2 Plan updates such as the Next 10 Plan.

July 2013 – June 2015 M2 Performance Assessment Response to Findings

7.	<p>Since three local agencies failed to request timely use of funds during the semi-annual review process, they did not receive their full allocation.</p> <p>Overtime, OCTA should work to identify patterns developing by local agencies neglecting to request timely use of funds extensions and address the underlying root causes.</p>	<p>Complete - Staff continues to ensure cities are aware of the impending deadline well in advance of expiration. Enhancements to the OC Fundtracker database has enabled the Local Programs' staff to closely monitor and track the progress of over 400 projects. Standard operating procedures were developed, and a new deadline tracking process was implemented in time for fall 2017 semi-annual review. Notifications to local agencies of at-risk projects goes out 180 days or more prior to the semi-annual review.</p>
8.	<p>Some external stakeholders noted that there is a lack of association of M2 with its projects, programs, and funding within their organizations, and among the general public.</p> <p>Guidelines or a media toolkit can help standardize and coordinate branding and awareness efforts to educate the general public and stakeholders to better highlight M2 projects and programs at project sites.</p>	<p>Underway - Staff has made enhancements to the M website to provide more comprehensive information on the program. Additionally, staff is working on a new identity for M2 to increase awareness of our local sales tax measure. The new identity, once approved, as well as cohesive color scheme across all projects and modes within the M Program, is intended to increase awareness and a better understanding of how the transportation sales tax measure is put to use.</p>
9.	<p>Small cities reported not having sufficient staff to review all M2 materials and documents.</p> <p>To make it more easy and accessible for constituents and city staff to be informed, OCTA can develop an information card for each M2 program and project.</p>	<p>Complete - Staff created new pages related to funding, project/program fact sheets and webpages on the OCTA website. Staff also reorganized existing content and added new pages and/or information to make it easier for cities and constituents to understand and obtain information from a cohesive source. Additionally, Staff performs regular quality control checks on M2 project pages, fact Sheets, and Measure M overview pages.</p> <p>OCTA continues to conduct regular workshops to ensure local agencies are equipped with all the necessary tools and to maintain their eligibility for funding, as well as apply for new project grants.</p>

M2 – Measure M2

OCTA – Orange County Transportation Authority

Caltrans – California Department of Transportation

I-405 – Interstate 405

PMO – Program Management Office



September 7, 2017

To: Executive Committee
From: Darrell Johnson, Chief Executive Officer
Subject: Next 10: Market Conditions Forecast and Risk Analysis

Overview

A Market Conditions Forecast and Risk Analysis has been prepared to inform the Orange County Transportation Authority's Next 10 Plan. The Next 10 Plan provides the framework to accelerate the delivery of Measure M2 freeway, streets and roads, transit, and environmental projects through the year 2026. In response to lower actual sales tax revenue, new forecasting methodology, and increased competition for available resources due to capital work underway in the Southern California Region, a Market Conditions Forecast and Risk Analysis was conducted. The report and findings are presented to the Board of Directors for review.

Recommendations

- A. Receive and file the Next 10 Market Conditions Forecast and Risk Analysis.
- B. Continue to monitor the changing environment and its effects on the advancement of the Next 10 Delivery Plan.
- C. Continue to prioritize Measure M2 projects for external funding consistent with the Orange County Transportation Authority's adopted programming policies.

Background

On November 7, 2006, Orange County voters approved the renewal of Measure M, the one-half cent sales tax for transportation improvements. Work on expedited delivery of Measure M2 (M2) began in 2007, with emphasis on organizational, procedural, and technical efforts to prepare for early realization of M2 benefits beginning in 2011. Subsequent to early startup efforts,

the 2008 Great Recession resulted in a significant reduction in the M2 sales tax revenue forecast. In response, the Orange County Transportation Authority (OCTA) developed the M2020 Plan that established program delivery priorities through 2020. In response to continued lower actual sales tax revenue, a new forecasting methodology was adopted in March 2016 and prompted the need to develop a revised delivery plan focusing on the next ten years. On November 14, 2016, the Board of Directors (Board) approved the M2020 Plans successor, the Next 10 Plan (Next 10), which provides a framework to accelerate the delivery of M2 freeway, streets and roads, transit, and environmental projects through the year 2026.

To ensure success of the Next 10, a market conditions forecast and risk analysis was conducted to review OCTA's ability to deliver the breadth of programs and projects. The review was sought to forecast and analyze market conditions for public infrastructure development in the state, surrounding counties, and specifically Orange County, over the next five to ten years, to help develop strategies to anticipate and manage competitive cost pressures and the availability of materials, equipment, labor, and qualified professional staff and services that would affect delivery of the Next 10 in the next decade.

Discussion

Consulting services were sought to conduct OCTA's Market Conditions Forecast and Risk Analysis. Following OCTA's procurement policies, the contract was awarded to the Orange County Business Council. The consultant reviewed the prior market conditions forecast and risk analysis, completed in 2008, as a basis for this analysis. In addition, the consultant conducted a risk analysis to identify risk factors that could affect OCTA's construction costs. A copy of the consultant's report is attached for Board review (Attachment A), which includes findings and recommendations resulting from the analysis.

Seven risk factors were identified, analyzed, and discussed:

1. Sustained low unemployment
2. Increases in residential construction
3. Consolidation in the public works construction industry
4. Increases in interest rates
5. Neighboring county transportation construction programs
6. Construction wage pressure
7. Future recession

Of these, the consultant's analysis identified four near-term cost risks that are expected to be particularly influencing: neighboring county transportation construction programs, construction wage pressures, sustained low statewide unemployment, and residential construction demand and the effect on the public works construction market.

A summary of the consultant's near-term costs risks are included below.

Neighboring County Transportation Construction Programs

With local transportation measures in place in neighboring counties, the Southern California region is in the midst of a large transportation construction program. The analysis showed substantial transportation construction spending from neighboring counties, with Los Angeles County programming approximately four to six times as much construction as Orange County in the five and ten-year time periods. Riverside and San Bernardino counties programs are also substantial and are pursuing construction programs that are larger than Orange County's Next 10 Program.

This is expected to create cost pressures as contractors will have more opportunities to bid on projects and will be less likely to reduce bid prices and potentially fewer bids. This was noted by the consultant as one of the primary cost risks for OCTA in the near term.

Construction Wage Pressure

The review identified that construction wage growth in Los Angeles, Orange, Riverside, and San Bernardino has accelerated since 2014. This likely reflects labor demand pressures in these sectors and indicates stronger wage growth than the national economy.

Historical data suggests that construction employment can expand or contract substantially with economic cycles, but periods of high construction employment have coincided with periods of high public sector infrastructure costs when measured by the California Department of Transportation Construction Cost Index (CCI). The analysis concludes, if private sector economy continues to grow, coupled with large public sector construction programs in Southern California, pressure on construction wages and public sector construction costs will likely increase.

Sustained Low Unemployment

The unemployment levels in California are approaching levels that in the past have been considered full employment. While wage growth has, until recently, been slow, the possibility of sustained and prolonged low unemployment raises the potential for continued construction cost pressures.

Wages have not shown much upward pressure during the recovery from the Great Recession, generally increasing from 2 percent to 2.5 percent per year during the recovery, suggesting that the economy may still have some slack. If so, the unemployment rate might remain at or near current levels for the next few years. The consultant concludes, overall, sustained near-full employment will likely exert more cost pressure than their model predicts, and could place OCTA in a structurally high-cost and increasing-cost environment for capital projects.

Increases in Residential Construction

A key change from the past is how building permits correlated with the CCI in the approximate dozen or so years before 2012. However, building permitting activity has not recovered as the state's economy has rebounded from the Great Recession. Statewide, building permitting activity is at relatively low levels, considering the low unemployment rate. The California Legislative Analyst Office (LAO) has demonstrated that construction in Los Angeles County, in particular, has lagged what is necessary to accommodate population growth. A 2015 LAO analysis found that between 1980 and 2010, California's major metropolitan areas added approximately 120,000 new housing units each year, while the LAO estimated that 210,000 new units per year would have been needed to meet demand.

Several bills have been introduced in the state legislature to address housing needs. Some of the policy proposals may substantially streamline the approval process for new housing. If such proposals dramatically increase new housing construction, which the consultant's analysis finds possible but not likely, that will increase demand for construction labor and materials.

In light of the near-term risk factors, the consultant's analysis suggests the following four recommendations to mitigate cost risks:

- 1) Developing early warning indicators that track data that can provide information about risk factors. This would include, but not be limited to, data on building permits, construction employment and wages, executive opinion about the local economy, and construction commodity costs.

- 2) Explore apprenticeship programs that can increase the pipeline of skilled construction labor.
- 3) Explore ways to continue to be a preferred client for public works construction companies to maintain bid competition.
- 4) Explore further accelerating the Next 10 Program, to the extent possible, as the near-term risks mostly suggest increased rather than decreased public works construction costs.

A summary of the consultant's identified risk factors, impact on costs, likelihood, comments, and possible OCTA mitigation is found in Attachment B.

Next Steps

Overall, the consultant's analysis identifies a strong potential that during the Next 10 delivery years, OCTA will experience an increasing-cost environment. This, coupled with a reduction in revenue, presents the potential for significant challenges in the delivery of M2 and the Next 10 as envisioned. The consultant's recommendations include a consistent message that OCTA should accelerate projects to the extent possible.

Next 10, along with successor plans (Early Action Plan and M2020 Plan), was developed to accelerate projects where possible which has proven successful. Delivering early has allowed OCTA to capture significant external funding and deliver projects in a lower cost environment. During the Next 10 time period, more than \$6 billion in transportation improvements promised to the voters in M2 are slated to be completed or underway by 2026. While final sales tax receipts for fiscal year 2016-17 have not been received, the forecasting agencies' economic outlook provided to date indicate further decline in sales tax collections. Staff is currently reviewing the Next 10 and preparing an update. The update will review and revise project costs with the latest information, take into account the revised revenue projections, and incorporate information provided in this Market Conditions Forecast and Risk Analysis. The Next 10 update is scheduled to go to the Board in the fall 2017.

Summary

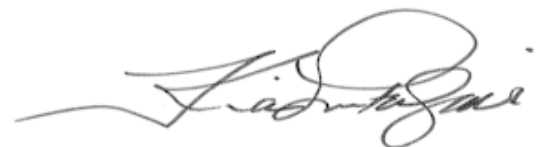
Overall, the final report of the Market Conditions Forecast and Risk Analysis that assessed OCTA's readiness to deliver the Next 10 indicates a potential increasing-cost environment. Staff will incorporate the recommendations from this analysis into the Next 10 update, scheduled to go to the Board in the October/November timeframe.

Attachments

- A. Orange County Business Council, OCTA Next 10: Market Conditions Forecast and Risk Analysis, August 2017
- B. Risk Factors, Effect on Public Works Costs, and Some Possible OCTA Mitigations

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ORANGE COUNTY
BUSINESS COUNCIL

ORANGE COUNTY BUSINESS COUNCIL

**OCTA Next 10: Market Conditions
Forecast and Risk Analysis**

August 2017

Marlon G. Boarnet, Ph.D. and Wallace Walrod, Ph.D.
with assistance from Benjamin Palmer and Debapriya Chakraborty

PREPARED FOR:

THE ORANGE COUNTY TRANSPORTATION AUTHORITY

Executive Summary

This research develops cost forecasts for the public works construction environment, as a tool to help guide implementation of the Orange County Transportation Authority's (OCTA's) Next 10 Delivery Plan. Following the Great Recession of 2008, cost pressures in transportation construction in Southern California were muted. The level of the California Department of Transportation (Caltrans) construction cost index (CCI) dropped by 26.6 percent from 2006 to 2010. Yet from 2012 to 2016, the Caltrans CCI rose 78 percent. Certainly some of that was a correction following the substantial drop in the CCI from 2006 to 2010, but several factors indicate that public works construction in Southern California has shifted from a low-demand/low-cost environment to one of high-demand and cost pressure.

OCBC modeled the relationship between the Caltrans CCI and several economic indicators, to forecast growth in public works construction costs five years and ten years into the future. The OCBC team found that the time trends in the Caltrans CCI are most associated with building permits and the unemployment rate. Regression-based models forecast a two percent increase in the level of the CCI in 2017 (from 2016), and then relatively stable levels going forward after 2017.

There are several reasons to believe that the forecasting model cannot capture all of the cost risk that will be present in the next five to ten years. One of the best predictors of the recent change in the CCI was changes in the state's unemployment rate. With the California unemployment rate at 5.35 percent for 2016, further declines are unlikely, and forecasting models will not be able to capture the full effect of sustained cost pressures from a full employment economy. For that reason, OCBC conducted a risk analysis to identify risk factors that could affect OCTA's construction costs.

Seven risk factors were analyzed and discussed:

1. Sustained low unemployment
2. Increases in residential construction
3. Consolidation in the public works construction industry
4. Increases in interest rates
5. Neighboring county transportation construction programs
6. Construction wage pressure
7. Future recession

Of these, the OCBC team believes that near term cost risks will be particularly influenced by sustained low statewide unemployment, residential construction demand and the effect on the public works construction market, neighboring county transportation construction programs, and construction wage pressures.

- **Sustained low unemployment:** The California economy is approaching unemployment levels that, in the past, have been considered full employment. While wage growth has, until recently, been slow, the possibility of sustained and prolonged low unemployment raises the potential for continued construction cost pressures.
- **Increased residential construction:** California has underbuilt new housing, relative to demand, for years. A 2015 state Legislative Analyst Office (LAO) analysis found that between 1980 and 2010, California's major metropolitan areas added approximately 120,000 new housing units each year, while the LAO estimated that 210,000 new units per year would have been needed to meet demand. Several bills have been introduced in the state legislature to address housing needs, and some policy proposals might substantially streamline the approval process for new housing. If such proposals dramatically increase new housing construction, which OCBC analysis finds possible but not likely, that will increase demand for construction labor and materials.
- **Neighboring county transportation construction programs:** The passage of Los Angeles' County's Measure M in 2016 was a highly visible indicator that neighboring counties are proceeding with ambitious construction programs. OCBC examined 1,388 projects reported in the Southern California Association of Governments financially constrained regional transportation plan. Our analysis shows that Los Angeles county is currently in the midst of a construction program that, in dollar value in five-year windows to 2030, will be from four to six times the size of OCTA's Next 10 plan, and Riverside and San Bernardino are both pursuing construction programs that are at least as large as OCTA's Next 10 plan.
- **Construction wage pressure:** In Orange, Los Angeles, Riverside, and San Bernardino Counties, construction wage growth ranged from 0.49 to 2.36 percent annually from 2012 to 2014, increasing to 4.39 to 5.3 percent annually from 2014 to 2016 (the most recent year for which data are available.)

In light of these factors, OCBC analysis suggests that OCTA can mitigate cost risk through the following policies:

- **Develop early warning indicators** that track data that can provide information about risk factors. This would include, but not be limited to, data on building permits, construction employment and wages, executive opinion about the local economy, and construction commodity costs.
- **Explore apprenticeship programs** that can increase the pipeline of skilled construction labor.

- **Explore ways to continue to be a preferred client** for public works construction companies, to maintain bid competition.
- **Explore further accelerating the Next 10 program**, to the extent possible, as the near-term risks mostly suggest increased rather than decreased public works construction costs.

I. Market Forecast, Quantitative Analysis

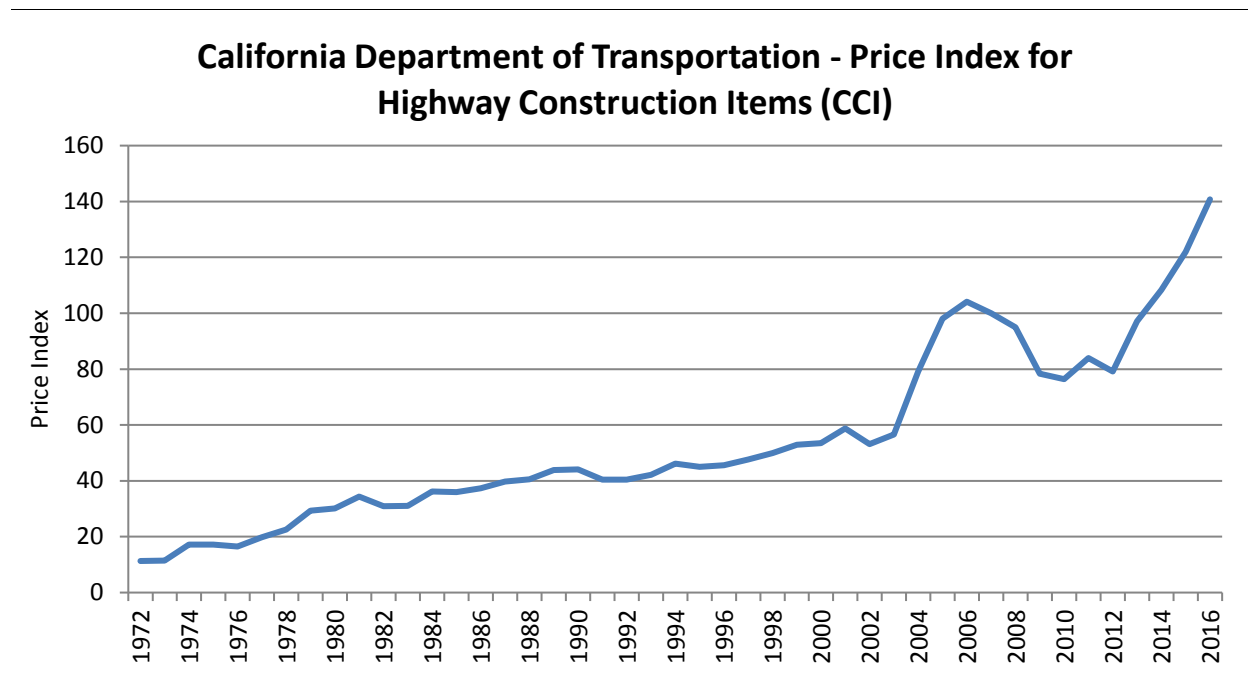
In 2008, the Orange County Business Council (OCBC) conducted the market conditions forecast for the Orange County Transportation Authority's (OCTA) M2 Early Action Plan (EAP). That forecast was done at the onset of the Great Recession, and OCBC predicted that construction costs would fall in the years immediately after 2008. The forecast predicted a falling or stable California Department of Transportation (Caltrans) construction cost index (CCI) to approximately the year 2012, which proved accurate. The Caltrans construction cost index fell from 100 in 2007 to 76.4 in 2010, and the Caltrans CCI did not rise to exceed its 2007 value until 2014 (See Table 1 and Figure 1). Yet the Caltrans CCI has risen rapidly in recent years, reaching 140.75 in 2016, suggesting that the after-effect of the Great Recession has ended.

Table 1: California Department of Transportation (Caltrans) Construction Cost Index (CC) by year, 1972-2016

California Department of Transportation - Price Index for Highway Construction Items (CCI)					
1972	11.3	1987	39.7	2002	53.1
1973	11.4	1988	40.5	2003	56.6
1974	17.2	1989	43.9	2004	79.1
1975	17.2	1990	44.1	2005	98.1
1976	16.5	1991	40.4	2006	104.1
1977	19.8	1992	40.4	2007	100
1978	22.6	1993	42.2	2008	95
1979	29.3	1994	46.2	2009	78.4
1980	30.1	1995	45	2010	76.4
1981	34.4	1996	45.6	2011	84
1982	30.9	1997	47.6	2012	79.2
1983	31	1998	49.9	2013	97.09
1984	36.2	1999	52.9	2014	108.32
1985	36	2000	53.5	2015	122.02
1986	37.3	2001	58.7	2016	140.75

Source: California Department of Transportation, Price Index for Selected Highway Construction Items

Figure 1: Time Trend of Caltrans Construction Cost Index (CCI), 1972 to 2016



Source: California Department of Transportation, Price Index for Selected Highway Construction Items

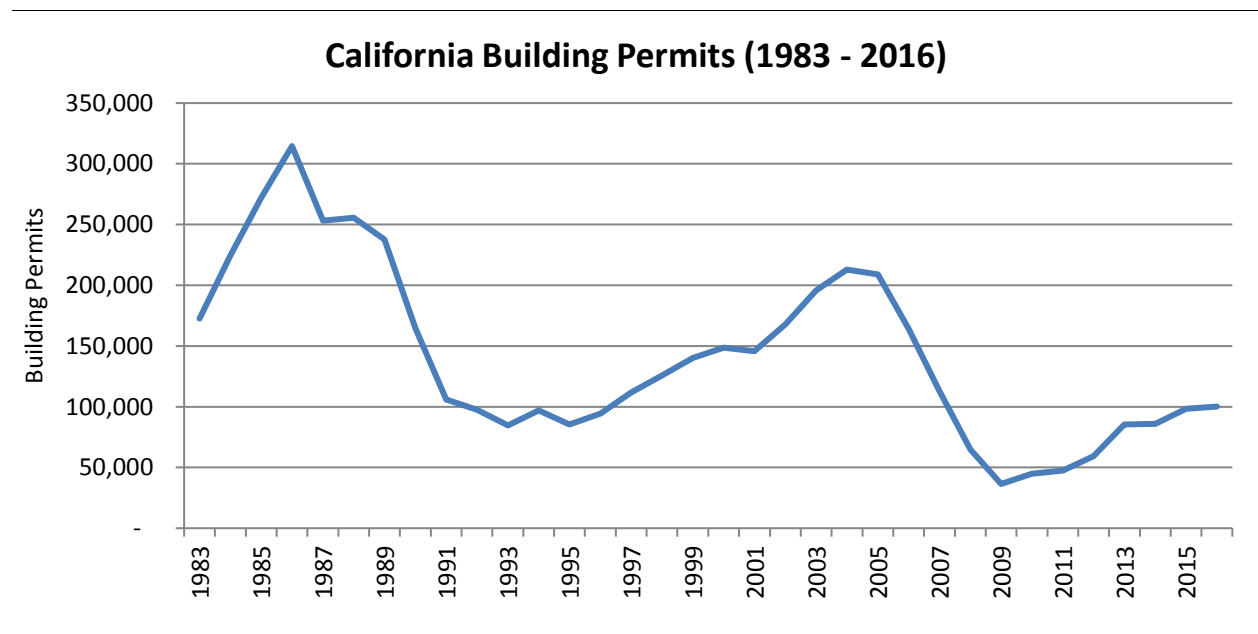
The 2008 M2 EAP market conditions forecast was based on a regression analysis that examined how four variables – building permits, population, employment, and income – are associated with the Caltrans CCI and other cost factors. In the 2008 analysis, building permitting activity was the best predictor of the Caltrans CCI (and of cost factors generally), and the large drop in building permitting activity that preceded the Great Recession predicted a period of slack markets for construction materials and labor. Table 2 and Figure 2 show the time trend of building permits in California from 1983 through 2016. Note that building permits in the state dropped from 208,972 in 2005 to 36,421 in 2009 and stayed below 100,000 every year until 2016, which saw 100,265 building permits issued in California – slightly less than half the “housing bubble” year values of 2004 and 2005.

Table 2: California Building Permits by Year

California Total Building Permits (1983-2016)					
1983	172,569	1995	85,293	2007	113,034
1984	224,845	1996	94,283	2008	64,962
1985	272,317	1997	111,716	2009	36,421
1986	314,569	1998	125,707	2010	44,762
1987	253,171	1999	140,137	2011	47,343
1988	255,559	2000	148,540	2012	59,225
1989	237,747	2001	145,757	2013	85,472
1990	164,313	2002	167,761	2014	85,844
1991	105,919	2003	195,682	2015	98,233
1992	97,407	2004	212,960	2016	100,265
1993	84,656	2005	208,972		
1994	97,047	2006	164,280		

Source: U.S. Census Bureau, Building Permit Survey

Figure 2: Time Trend of California Building Permits



Source: U.S. Census Bureau, Building Permit Survey

The forecast from 2008 was influenced by the housing bubble's coincident rise in building permits, the increasing level of the Caltrans CCI, and the substantial decline in permitting. This led to a prediction of a slack construction materials and labor market for the years following 2008.

Looking forward toward developing a forecast for the next five and ten years, the earlier M2 EAP forecast provides context, but what is striking is how conditions have changed. The economy has recovered, cost factors (including the Caltrans CCI) are rising, suggesting tightening demand, but building permitting activity has seen at best a slow and still incomplete recovery. The following observations and questions help set the stage for the analysis.

1. Building permitting activity may have been, at least in part, a proxy for broader factors (such as coincident increases and then contractions in world demand, from 2000 to 2012) in the 2008 forecast. Certainly, to some extent, building activity is a structural factor that affects the cost of public works construction. The question is to what extent materials and labor are substitutable over public- and private-sector markets, and to what extent the relationship observed in the 2008 analysis continues to be a useful forecasting tool today.
2. Will price and supply factors, going forward, be most strongly influenced by the national and world economy or by local conditions, including the public works construction program in Orange and other southern California counties?
3. Around 2012, the Caltrans CCI began to increase rapidly while state building permitting activity, while also increasing, remained well below peaks from previous time periods. Does this signal a weakening of the relationship between building permits and public sector construction costs going forward?

To foreshadow our results by briefly summarizing the answers to the above questions, the OCBC team believes that a market forecast going forward should rely less exclusively on building permits than did the M2 EAP forecast. The relationship between permits and, for example, the Caltrans CCI shows signs of change, and there is discussion later in this report how supply-side factors, including consolidation in the construction and engineering services industry in the years after 2008, might importantly affect cost pressures. Before going into that in detail, our analysis starts with descriptive analytics.

Descriptive Analysis

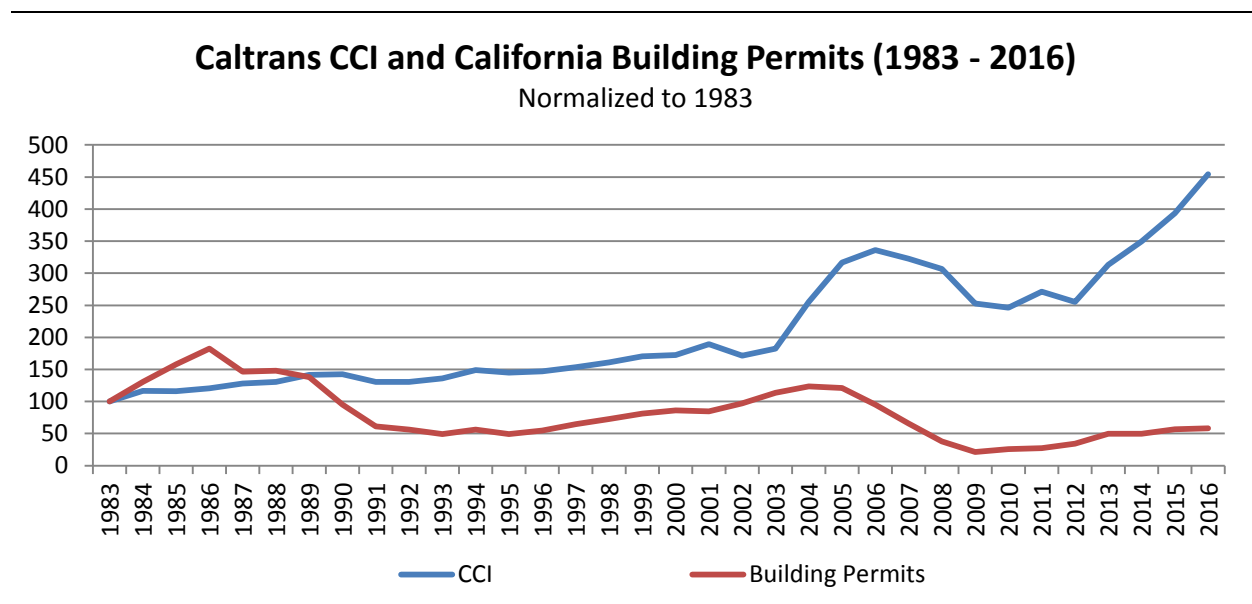
The graph of the Caltrans CCI in Figure 1 shows clear time trends that follow the business cycle. The rapid increase in the CCI during the housing bubble years following 2002 is followed by a decline after 2008, and then an increase in the past four years. The long-term trend, judging by Figure 1, suggests an increase in the growth rate of the Caltrans CCI following 2003. The average annual growth rate of the Caltrans CCI was 5.3 percent from 1972 to 2003 and 7.3 percent from 2003 to 2016.

Figure 3 graphs both the Caltrans CCI and statewide building permits, from 1983 to 2016. Both series, the CCI and building permits, are normalized to a value of 100 in 1983. The value in each year is divided by the 1983 value, such that the values of both series in any year show the

percentage change from 1983 to that year. For example, the normalized Caltrans CCI value in 2006 is 335.8, indicating that the CCI had increased 235.8% (335.8 minus 100) from 1983 to 2006. Normalizing values allows both series to be represented with the same y-axis, despite dramatically different values in the underlying data, and allows readers to easily see percent change from the 1983 base year.

In Figure 3, starting in 2000, building permits increased in California, while the Caltrans CCI showed an increase that was more dramatic, in percentage growth terms, than building permits. Both series fall following 2006, but the increase in the Caltrans CCI beginning in 2012 is not accompanied by much of an increase in building permits.

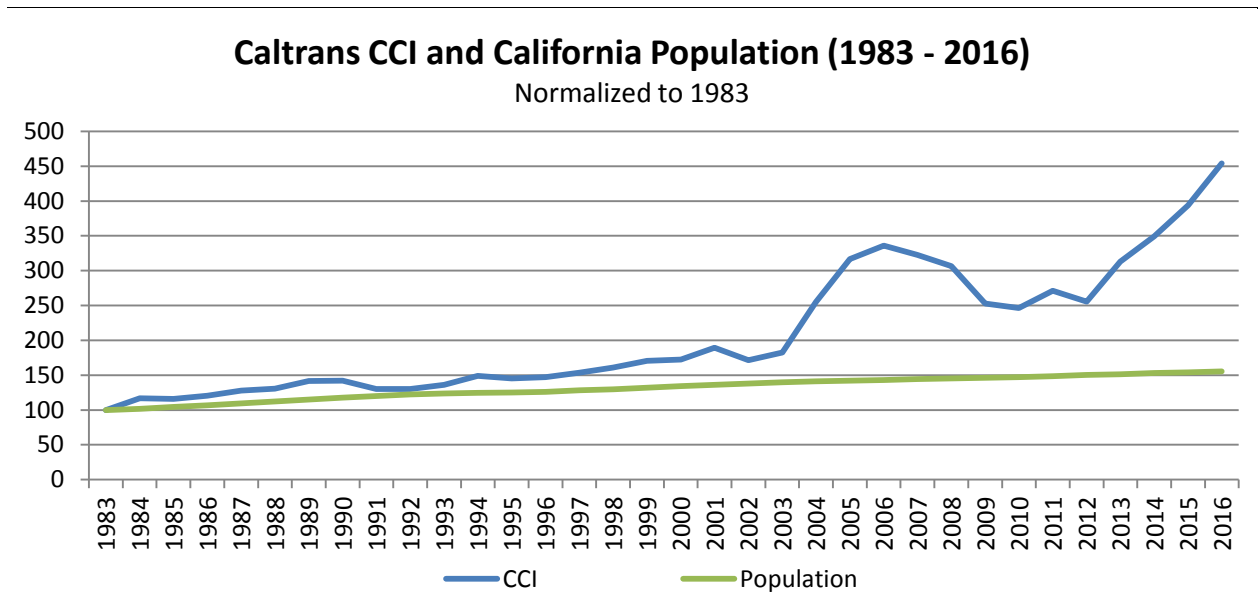
Figure 3: Normalized Caltrans Construction Cost Index (CCI) and California Building Permits, 1983 to 2016



Source: California Department of Transportation, U.S. Census Bureau, Building Permit Survey

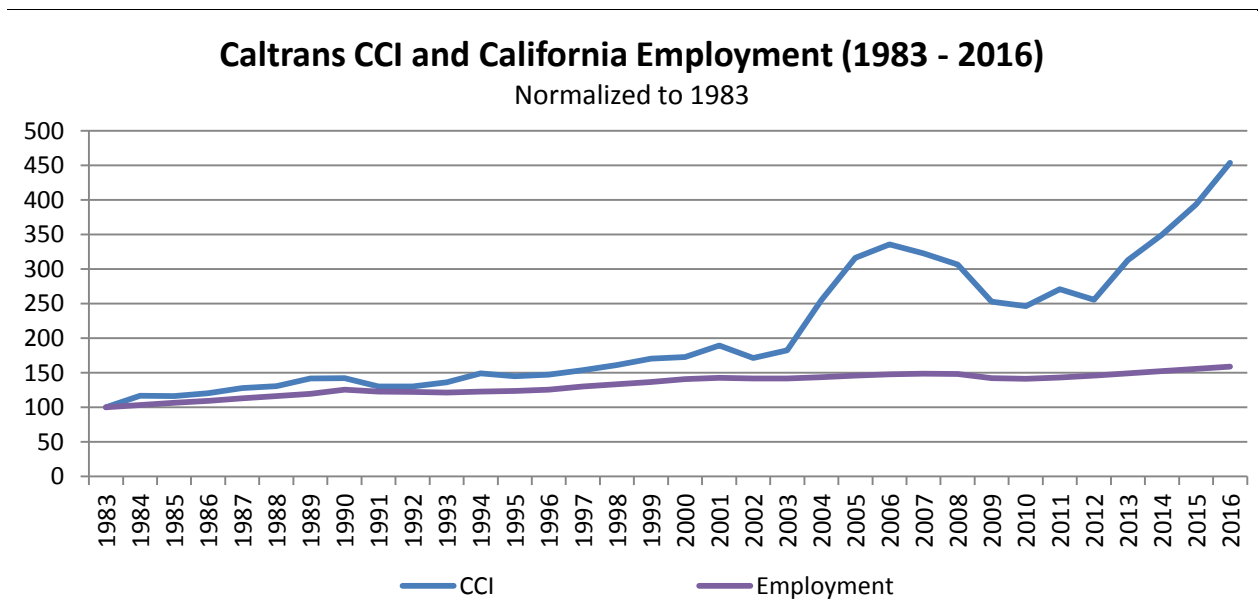
Figures 4, 5, 6, and 7 show the same normalized time trend for the Caltrans CCI compared to population (Figure 4), employment (Figure 5), total wages (Figure 6), and per capita personal income (Figure 7). Wages and income are in nominal dollars, not adjusted for inflation. All values are for California. Data sources and raw data are shown in appendix table A1.

Figure 4: Normalized Caltrans Construction Cost Index (CCI) and California Population, 1983 to 2016



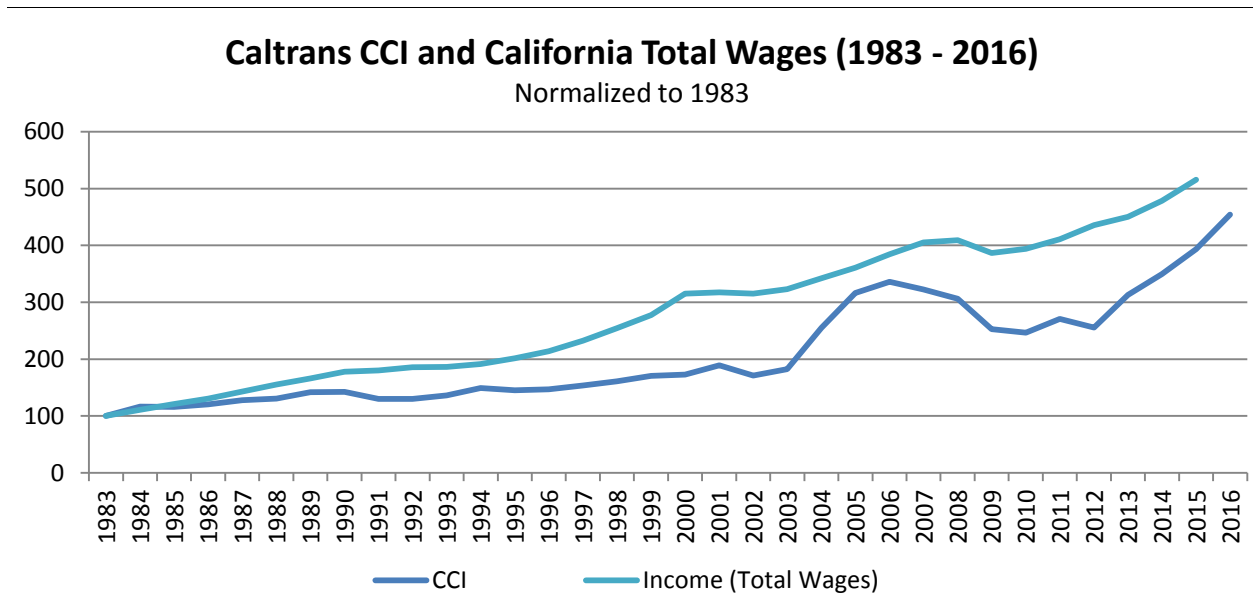
Source: California Department of Transportation, U.S. Census Bureau

Figure 5: Normalized Caltrans Construction Cost Index (CCI) and California Employment, 1983 to 2016



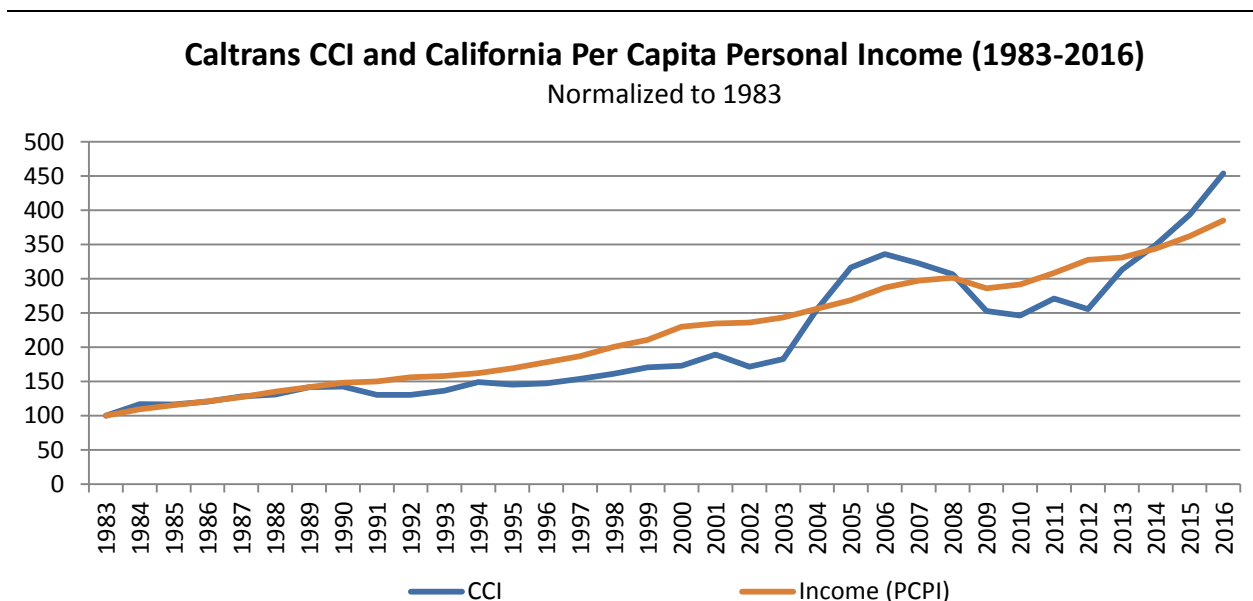
Source: California Department of Transportation, California Employment Development Department

Figure 6: Normalized Caltrans Construction Cost Index (CCI) and California Total Wages, 1983 to 2016



Source: California Department of Transportation, California Employment Development Department

Figure 7: Normalized Caltrans Construction Cost Index (CCI) and California Per Capita Personal Income (PCPI), 1983 to 2016



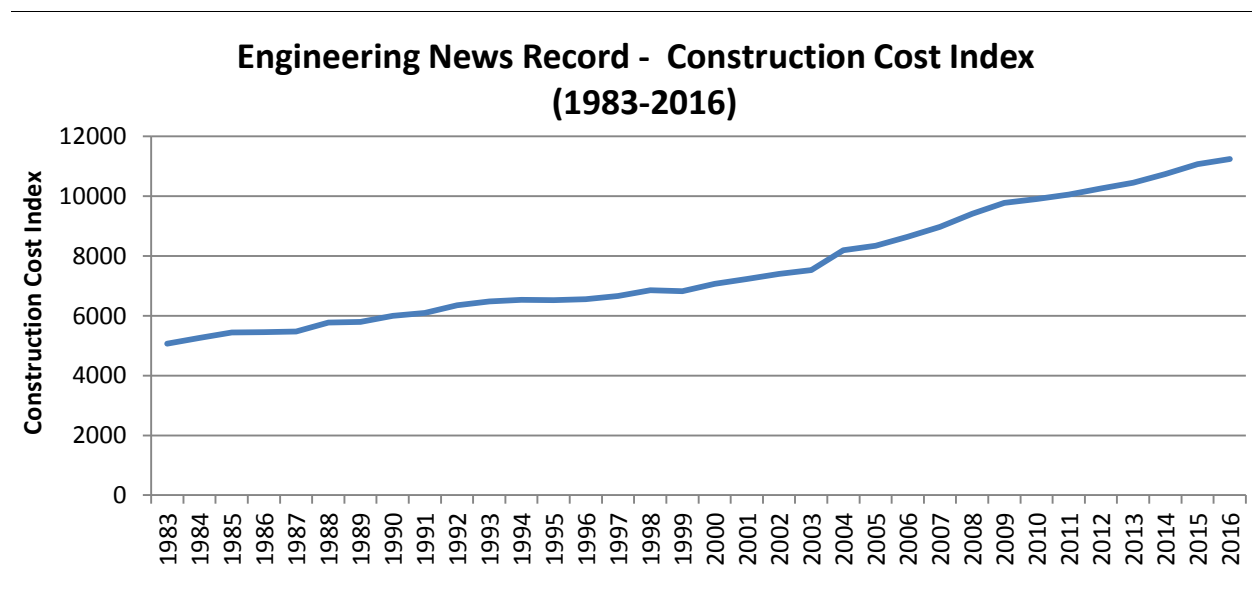
Source: California Department of Transportation, U.S. Bureau of Economic Analysis

In addition to the CCI, Caltrans reports cost factors for materials, which will be discussed later in this report. The OCBC team also analyzed data from Engineering News Record, which reports a construction cost index (ENR CCI) and a building cost index (ENR BCI) for the Los Angeles metropolitan area.

The ENR Cost Index formula contains four pricing components including: steel, lumber, cement and labor costs. This price data for the three building materials are gathered from a single supplier of each building material in each city. Therefore, the suppliers may be located within Los Angeles city limits, or they may not, but instead may be somewhere within the greater metropolitan area. Considering that these building material prices are collected from a single source for each material in each city/metropolitan area, the price is a spot price; it is not a comprehensive price based on multiple sources. ENR has no way of knowing if their sources are charging the average price for their large metropolitan area for a given material, or a higher or lower than average price. For that reason, the ENR data and indices are not capable of determining average prices but rather are better suited to tracking the change (fluctuation) of the commodity price in a specific city over time.

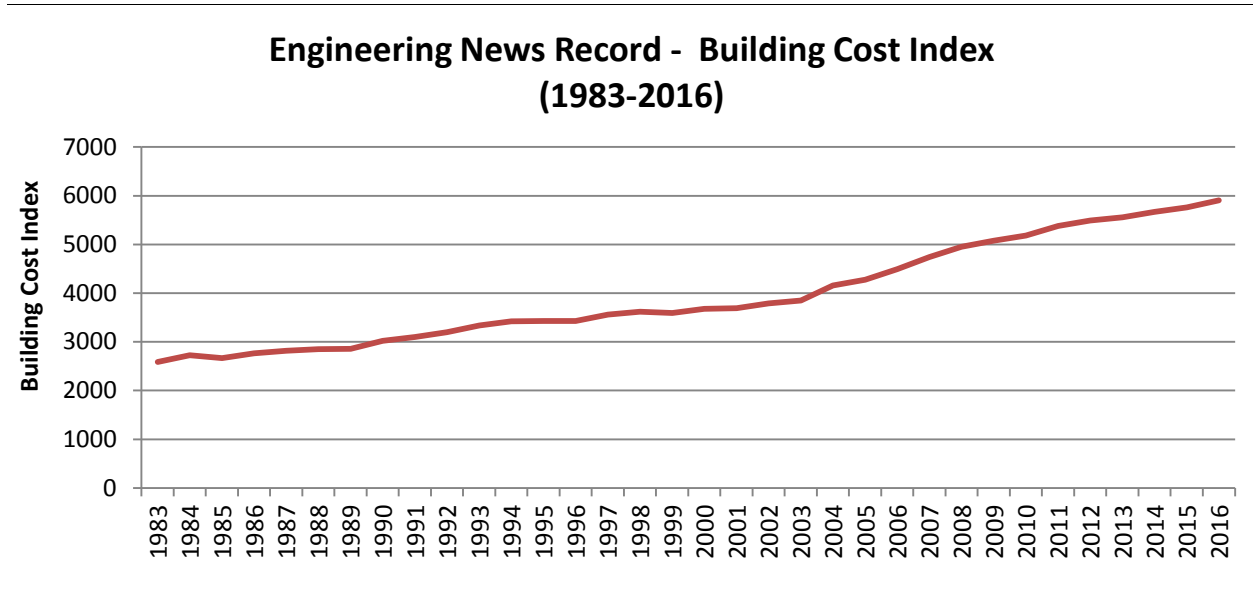
The ENR indices measure construction and building costs that can apply to both the private and public sectors, whereas the Caltrans CCI is designed to measure public sector transportation infrastructure costs. Figures 8 and 9 show the time trend of the ENR CCI and BCI respectively, and the data are in Appendix Table A-2.

Figure 8: Engineering News Record Construction Cost Index (CCI), 1983 – 2016



Source: Engineering News Record Monthly Release

Figure 9: Engineering News Record Building Cost Index (BCI), 1983 – 2016



Source: Engineering News Record Monthly Release

The trends for the ENR CCI and BCI are smoother than for the Caltrans CCI, suggesting that it will be difficult to associate those variables with changes in structural variables such as building permits, population, employment, or wages. The M2 EAP analysis did not find the ENR CCI and BCI as useful as the Caltrans CCI, and our analysis similarly finds those less useful for the Next 10 forecast. Appendix Figures A-1 through A-5 show the normalized values of the ENR CCI and ENR BCI versus, respectively by appendix figure, Los Angeles metropolitan (five-county) area building permits, Los Angeles metropolitan area population, Los Angeles metropolitan area employment, Los Angeles metropolitan area wages, and Los Angeles metropolitan area per capita personal income. None show visual relationships to the ENR CCI or BCI. For that reason, our analysis does not use the ENR indices in the forecast model.

Regression Models

1. Models from 2008 Market Conditions Report

The OCBC team reran models that reproduced, as closely as possible with available data, the regression models in the 2008 market conditions report. Those models were classified into two types – levels models (regressing the level of the Caltrans CCI on the levels of the four key independent variables – building permits, population, employment, and total wages – all for California), and change models, regressing the level of the Caltrans CCI on the changes of the

same four key independent variables. Both the levels and change models include first and second lags of Caltrans CCI on the right hand side. The regression equations are shown below.

Levels Model

$$Y_t = \beta_0 + \beta_1 Y_{t-1} + \beta_2 Y_{t-2} + \beta_3 BP_t + \beta_4 BP_{t-1} + \beta_5 BP_{t-2} + \beta_6 INC_t + \beta_7 INC_{t-1} + \beta_8 INC_{t-2} + \beta_9 EMP_t + \beta_{10} EMP_{t-1} + \beta_{11} EMP_{t-2} + \beta_{12} POP_t + \beta_{13} POP_{t-1} + \beta_{14} POP_{t-2} + u$$

where Y = cost or price index

BP = building permits

INC = total wages

EMP = total employment

POP = population

u = the regression error term

and the subscripts "t", "t-1" and "t-2" indicate years ("t" being the current year, "t-1" is a one year lag, and "t-2" is a two year lag)

β 's are regression coefficients

Changes Model

$$Y_t = \beta_0 + \beta_1 Y_{t-1} + \beta_2 Y_{t-2} + \beta_3 BP_CH_t + \beta_4 BP_CH_{t-1} + \beta_5 BP_CH_{t-2} + \beta_6 INC_CH_t + \beta_7 INC_CH_{t-1} + \beta_8 INC_CH_{t-2} + \beta_9 EMP_CH_t + \beta_{10} EMP_CH_{t-1} + \beta_{11} EMP_CH_{t-2} + \beta_{12} POP_CH_t + \beta_{13} POP_CH_{t-1} + \beta_{14} POP_CH_{t-2} + u$$

where the term "CH" behind a variable indicates the year-to-year change

(e.g. $BP_CH_t = BP_t - BP_{t-1}$)

The results are shown in Appendix Tables A3 and A4. Table A3 shows the two regressions, levels and changes models, for the Caltrans CCI. Table A4 shows the same models fit on data for the Los Angeles Metropolitan Area, with the Engineering News Record (ENR) construction cost index (ENR CCI) as the dependent variable in the first two columns of Table A4. The ENR building cost index (BCI) is the dependent variable in the second two columns of Table A4. The dependent variables in Tables A4 are the same variables in Table A3, but measured for the Los Angeles metropolitan statistical area.

The variables for building permits are only significant, at the ten percent level, for the two lags in the changes model for the Caltrans CCI. That pattern of insignificance or marginal (10% significance level), coupled with the graphical analysis in the previous section, led us to conclude that building permits, by themselves, are not a good predictor of cost pressures for the OCTA Next 10 delivery timeframe, to the year 2027. Our analysis developed additional regression models, described below.

2. Regressing Caltrans CCI on Building Permits and Unemployment Rate

Given that the descriptive analysis suggests a relationship between the Caltrans CCI and the state's unemployment rate, in year-on-year percent changes, and until recent years suggests a similar relationship with building permits, our analysis fit simple regression models, shown in Tables 3 and 4 below. The models regressed the year-on-year percent change in the Caltrans CCI on (1) the year-on-year percent change in building permits in the state, (2) the year-on-year percent change in the state's unemployment rate, and (3) the year-on-year percent change in both building permits and the unemployment rate. Results are shown in Table 3. Table 4 repeats the same model with all variables as three-year moving averages of annual percent changes, which smooths the data.

Table 3: Caltrans CCI Year-on-Year Percent Change Regressed on Percent Change of Building Permits and Unemployment Rate

	Building Permits only		Unemployment. Rate only		Both	
	coefficient	t-statistic	coefficient	t-statistic	coefficient	t-statistic
Building permits, year-on-year % change	0.2141	2.62			0.0066	0.06
Unemployment rate, year-on-year % change			-0.4218	-4.33	-0.4164	-3.1
sample size	33		27		27	
Years	1984-2016		1990-2016		1990-2016	
R-squared	0.1809		0.4284		0.4285	
Note: All data are for California						
Coefficients statistically significant at 5% level shown in bold						

Table 4: Caltrans CCI Year-on-Year Percent Change, 3-year Moving Average Regressed on Percent Change of Building Permits and Unemployment Rate, 3-year Moving Average

	Building Permits only		Unemployment. Rate only		Both	
	coefficient	t-statistic	coefficient	t-statistic	coefficient	t-statistic
Building permits, year-on-year % change	0.2186	3.12			-0.0334	-0.32
Unemployment rate, year-on-year % change			-0.405	-5.03	-0.4344	-3.54
sample size	31		25		25	
Years	1986-2016		1992-2016		1992-2016	
R-squared	0.251		0.5241		0.5263	
Note: All data are for California						
Coefficients statistically significant at 5% level shown in bold						

The coefficient on the unemployment rate is always statistically significant and highly stable in magnitude across all models in Tables 3 and 4. The coefficient on building permits is similarly stable in magnitude when it is statistically significant, which is only in the bivariate regression shown in the first column of Tables 3 and 4. When both building permits and the unemployment rate are included in the percent changes and three-year moving average percent change models, only the unemployment rate is statistically significant. For that reason, the OCBC team used the unemployment rate to develop a simple forecasting model for Caltrans CCI, shown in the next sub-section. The ENR data are too smooth and likely not sufficiently focused on public works costs to provide a reliable cost forecast. The forecast of the Caltrans CCI is the best available numerical forecast that can be applied to OCTA's conditions.

3. Forecasting Model for Caltrans CCI

The estimated regression coefficients from the second column of Table 3 (the bivariate regression of the percent annual change in the Caltrans CCI on the percent annual change in the California unemployment rate) were used to develop a forecast of the Caltrans CCI, to the year 2027. The results are shown in Table 5, below.

Table 5: Five-Year Forecast (to 2022) and Ten-Year Forecast (2027) for Caltrans CCI, from Unemployment Rate Year-on-Year Percent Change Model

<u>Year</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2027</u>
CA Unemp. Rate	7.50	6.20	5.35	5.10	5.05	5.00	5.05	5.00	5.00	4.60
% YOY change, CA Unemp		-17.33%	-13.71%	-4.67%	-0.98%	-0.99%	1.00%	-0.99%	0.00%	-1.65%*
Caltrans CCI level, actual	108.32	122.02	140.85							
Predicted CCI % YOY change			5.78%	1.97%	0.41%	0.42%	-0.42%	0.42%	0	0.70%
Predicted CCI Level				149.00	151.93	152.56	153.20	152.55	153.19	158.61

* Total percent change in forecast unemployment rate from 2022 value is -8%, which is -1.65% annually over five years.

Note: California unemployment rates are forecast values after 2016.

Note that the predicted unemployment rate values, after 2016, are averages of the forecasted values from the California Legislative Analyst Office, the California Department of Finance, the Los Angeles Economic Development Corporation, and the California Department of Transportation (Caltrans). Only Caltrans has forecasted state unemployment rates for years beyond 2020, and so the 2021 and 2022 and later values for the state unemployment rates are Caltrans forecasts. The forecasted unemployment rate data to 2022 that are used to obtain the average forecast unemployment rates in Table 5 are shown in Appendix Table A5.

The forecast in Table 5 shows a leveling of the Caltrans CCI at levels not much higher than the current level. With the 2016 California unemployment rate at 5.35 percent, close to full traditional “full employment” levels, the model will imply that the increase in the Caltrans CCI will slow and level off.

While changes in the state unemployment rate are an excellent correlate of changes in the Caltrans CCI, particularly in approximately the past fifteen years, a forecasting model based on changes in the unemployment rate cannot capture sustained public works cost pressure from an economy operating at or near full employment. The OCBC team experimented with models that relate the levels of the Caltrans CCI to the level of the state unemployment rate, but those predicted the same leveling of the Caltrans CCI. Any forecasting model will be limited when the future is unlike the past, and California may be entering a period of relatively full employment – very different from the past few years. OCBC does not believe that a simple forecasting model based only on demand-side proxies such as the unemployment rate or building permits can capture cost pressures that might arise during sustained periods of full or near-full employment. While our analysis finds the slowing of the increase in the Caltrans CCI after 2017 to be credible, the OCBC team believes that the five-year forecast might understate – possibly importantly so – cost pressures and hence increases in the Caltrans CCI going forward. This report discusses reasons for that possible understatement in the context of a risk analysis, in the next sub-section.

Ten-Year Forecast: The only available unemployment rate forecasts beyond 2022 are from Caltrans who project that the California unemployment rate will decrease from 5.0 percent in

2022 to 4.6 percent in 2027.¹ Given that unemployment rate forecast, the model predicts an increase in the Caltrans CCI to 158.36 in 2027. The OCBC team believes that the unemployment rate estimate and the model relationship at the ten-year window is too uncertain to be useful, and while the ten-year forecast is shown in Table 5, our analysis cautions against reading much into the 2027 forecast. At the ten-year timeframe, the OCBC team believes that a risk analysis will be more useful, and the key risks are described below. A risk analysis will be important even for near-term years, and the OCBC team encourages OCTA to view the risk analysis described in Section II as an integral part of their cost forecasting exercises.

II. Discussion and Risk Analysis

There are several factors which could modify the forecast shown in Table 5. Potential risk factors are summarized and listed below, along with possible OCTA mitigation strategies for each risk factor, in Table 6, at the end of this sub-section.

A. Sustained Low Unemployment

In May of 2017, the national unemployment rate was 4.3 percent, a 16-year low compared to when the unemployment rate registered a reading of 4.2 percent in February 2001, according to the U.S. Bureau of Labor Statistics. The unemployment rate will likely not fall much lower. Wages have not shown much upward pressure during the recovery from the Great Recession, generally increasing from 2 percent to 2.5 percent per year during the recovery, suggesting that the economy may still have some slack, and if so the unemployment rate might remain at or near current levels for the next few years.²

Models based on historical data may not be able to represent the cost pressures endemic in a state economy that is near full employment and that remains so for at least a few years. In the past, full employment prompted the Federal Reserve Bank to raise interest rates, inducing recessions, and hence limiting the time that the national economy remained at full employment. Given slack wage pressure, the Federal Reserve Bank may be less likely to rapidly raise interest rates, and a global savings glut (discussed below) will exert downward pressure on interest rates. On net, it is possible that unemployment could remain low for the foreseeable next several years, and possibly within the timeframe of at least the five-year Table 5 prediction.

¹ See http://www.dot.ca.gov/hq/tpp/offices/eab/index_files/2016/FullReport2016.pdf.

² For information on wage growth, see the Economic Policy Institute's nominal wage tracker, at <http://www.epi.org/nominal-wage-tracker/>.

The pressures on infrastructure costs will be difficult to predict, and would depend in part on supply response. Briefly, it is unlikely that raw materials supplies would expand to meet demand. (In Section III our analysis discusses cost pressures on raw materials.) Overall, sustained near-full employment will likely exert more cost pressure than the Table 5 model predicts, and could place OCTA in a structurally high-cost and increasing-cost environment for transportation projects.

B. Residential Construction Accelerates

Building permits were correlated with the Caltrans CCI in the approximately dozen or so years before 2012, but building permitting activity has not recovered as the state's economy has rebounded from the Great Recession. Statewide, building permitting activity is at relatively low levels, particularly so for an economy with low unemployment. The problem is in part political – local governments are reluctant to approve large or even medium-size residential construction projects due to “not in my backyard” (NIMBY) pressures from neighbors. The California Legislative Analyst Office (LAO) has demonstrated that construction in Los Angeles County, in particular, has lagged well behind what would be needed to accommodate population growth. A 2015 LAO analysis found that between 1980 and 2010, California's major metropolitan areas added approximately 120,000 new housing units each year, while the LAO estimated that 210,000 new units per year would have been needed to meet demand.³

The housing shortage and underbuilding is, in part, a characteristic of California's politics, and the risks to OCTA related to building permitting and construction are as much political as economic. The state's housing crisis has sparked political attention. There were over 100 bills dealing with housing in the California legislature as of early May, and while many if not most will not pass, for the second year in a row Sacramento is debating policies that might structurally change the incentives for localities to approve or deny building projects.⁴ In 2016, Governor Brown suggested a “by-right” zoning legislation that would have provided presumptive (by right) approval for any residential construction project that was consistent with the local zoning code and that provided affordable units that met 20% (far from transit) or 10% (near transit) targets. That proposal met with opposition in the legislature, and the governor's 2016 proposal was not introduced in the assembly or state senate.⁵ Yet the large amount of legislative activity related to housing in this session indicates that the debate has, if anything, intensified. If the state enacts changes that require localities to approve residential construction projects that would have

³ California Legislative Analysts Office, “California's High Housing Costs: Causes and Consequences,” 2015, available at <http://www.lao.ca.gov/reports/2015/finance/housing-costs/housing-costs.aspx>, accessed June 10, 2017.

⁴ Libby, Sara, “California's Legal Assault on NIMBY's begins,” Citylab, May 9, 2017, available at <https://www.citylab.com/equity/2017/05/californias-legal-assault-on-nimbys-begins/525840/>, accessed June 10, 2017.

⁵ Barmann, Jay, “Governor Brown's ‘By-Right’ Housing Fast-Track Proposal Dead in the Water,” SFist, Aug. 22, 2016, http://sfist.com/2016/08/22/governor_browns_by_right_housing_fa.php.

otherwise been blocked, or if reforms to the California Environmental Quality Act reduce the ability of citizens to oppose projects or that expedites challenges, California might see a substantial increase in construction. Already the Inland Empire – a location of relatively more affordable housing in Southern California – is seeing large increases in residential construction. The Inland Empire saw the fastest growth in construction jobs among any U.S. metropolitan area in March versus a year earlier.⁶

If California's political environment changes in ways that reduce the power of NIMBY opposition, the state might see a rapid and large increase in building permits, as many of the state's urban and coastal counties have backlogs of residential building that has lagged population growth. That could create substantial cost pressure as materials and skilled labor could be diverted from public works to private residential construction. Even absent such policy changes, the residential construction industry is growing rapidly in the Inland Empire. If policies change to allow more rapid residential permitting and construction, the resulting "burst" of residential construction might be temporary, if supply eventually meets pent-up demand, but that could take a few years and the result would be a large cost pressure on OCTA projects if residential building accelerates. Such a dramatic change in California's residential construction regulatory framework should be regarded as unlikely, but the pent-up pressure for more homes is structural. Despite the increasing political attention to the state's housing affordability crisis, the trend of the past four decades has been toward a more rigid and delay-prone residential construction environment. Overall, a change that allows more building in California would be an unlikely outcome, albeit an outcome that is growing more likely and an outcome that could exert substantial cost pressure on OCTA projects. Without policy change, there is still likely to be increasing residential construction, but likely concentrated in inland counties where permitting is politically easier.

C. The Public Works Construction and the Associated Professional Support Industries Continue to Consolidate

Supply-side factors, such as market structure and competition in the public works construction and associated architecture-engineering support services industries, are likely an important factor in current cost pressures. During and immediately following the Great Recession, the public works construction industry saw several consolidations, particularly among architecture, engineering, and design firms. Smaller firms merged with larger, often multi-national practices. At the same time, our earlier 2008 market conditions analysis suggested that firms during the 2008 time period may have been reducing their bid price to win enough business to cover variable costs. During the depths of the recession, there is anecdotal evidence that firms might have bid below their typical profit margin, and public works agencies reported bids coming in below estimated costs during the recession years. Those days have passed. The recent

⁶ Lansner, Jonathan, "California, Inland Empire in Building Booms, 6 Things to Know," Orange County Register, May 2, 2017, available at <http://www.ocregister.com/2017/05/02/california-inland-empire-in-building-booms-6-things-to-know/>, accessed June 10, 2017.

consolidations pruned marginal firms and, when combined with growth in the economy, have likely allowed firms to return to pre-recession bid practices.

Going forward, the question is whether the public works construction market will see further consolidation. If so, competition for bids might decrease. Our analysis suggests this as a risk factor that OCTA should monitor, continuing their tracking of the number of bidders. Following the 2008 market conditions analysis, OCTA successfully implemented several of OCBC's recommendations and measures to facilitate the bid process. In response to risk from consolidation of bidders, OCTA can continue and, where possible, enhance those efforts that make the agency a preferred client. Additionally, look to do what can be done to increase competition in the public works infrastructure market, acknowledging that OCTA has worked hard to be a client of choice.

D. Increasing Interest Rates

The Federal Reserve Bank began what most observers expect to be a program of sustained, moderate interest rate increases in December of 2015.⁷ Interest rates are still near the lowest levels seen in the past several decades, and the U.S. is likely to be in a low but increasing interest rate environment going forward. The aging of the Baby Boom population in all developed countries, and rapid aging in middle income countries, has created a global savings glut in the form of Baby Boomer retirement savings. That will exert downward pressure on interest rates. While rates will likely increase in future years due to Federal Reserve Bank policy activity, the OCBC team expects the increases to be more moderate but possibly sustained over a longer period of time than following the peak of the business cycles in the 1970s through the 1990s. A return to the high interest rate environment of the 1980s is unlikely, even though interest rates will rise. This will increase OCTA's borrowing costs and, to the extent that rising interest rates reduce the demand for residential construction, exert a downward cost pressure on public works projects.

E. Growth in Public Works Demand from Neighboring Counties

With the passage of Measure R in 2008 and Measure M in 2016, Los Angeles County is in the midst of a large transportation construction program. That program, and similar half-cent sales tax infrastructure programs in other Southern California counties, will create cost pressures as private firms have more opportunities to bid on projects and hence those firms may be less

⁷ See, e.g., the discussion in Tankersley, Jim, "Federal Reserve Raises Interest Rates for Second Time in a Decade," Washington Post Wonkblog, Dec. 14, 2016, available at https://www.washingtonpost.com/news/wonk/wp/2016/12/14/federal-reserve-expected-to-announce-higher-interest-rates-today/?utm_term=.f811c5091e1f, accessed June 10, 2017.

willing to reduce bid prices. Our analysis sees and highlights this as one of the primary cost risks for OCTA in the next few years. The construction activity from neighboring counties is programmed by self-help sales tax increases that have been approved by voters. Those neighboring county construction programs are part of the structural landscape for public works projects. Public sector demand for public works construction will increase as Los Angeles' Measure M funds become available, creating increasing demand for materials and skilled labor.

To better understand pressure from building programs in neighboring counties the OCBC team examined the construction program reported in the 2016 SCAG Regional Transportation Plan (RTP). Our analysis examined 1,388 projects in Los Angeles, Riverside, and San Bernardino Counties, that are part of the financially constrained RTP, with completion years from 2016 to 2030.⁸ Tables 6 and 7 list the estimated cost (in current year dollars) for these projects, by county, with Orange County Next 10 projects removed, which explains the lack of cost estimates for Orange County during the 2021-2025 time period. In other words, if a project is part of Next 10 and part of the SCAG financially constrained RTP, those project cost estimates will not be in Table 6 or Table 7, but rather in Table 8. Projects are grouped by highway (Table 6) and transit (Table 7), and listed in five-year bands based on project end date. All data are from the 2016 RTP Transportation System project list, appendix, adopted April, 2016.⁹

The 2016 RTP project list is divided into three parts: the 2015 Federal Transportation Improvement Program (FTIP), the financially constrained plan, and the strategic plan. The 2015 FTIP contains six years of projects that use federal funds or that require federal approval; the financially constrained plan includes projects for which revenues have been reasonably identified; the strategic plan is additional projects that the RTP proposes to program if additional revenues become available. The financially constrained plan is the most reasonable starting point, and unlike the FTIP the financially constrained plan includes projects with completion dates throughout the life of the RTP (2016 through 2040) and lists clear classifications that categorize each project as either transit or highway. Hence Tables 6 and 7 are based on summaries of the financially constrained plan.

⁸ Our analysis excluded projects for which OCTA is listed as the lead agency, to capture work in counties that neighbor Orange County. Ventura and Imperial Counties were also excluded, again to focus on counties that neighbor Orange County. Hence the project list studied is a subset of the complete RTP project list.

⁹ See http://scagrtpscscs.net/Documents/2016/final/f2016RTPSCS_ProjectList.pdf.

Table 6: Freeway Construction Cost Estimates, by County, 2016-2030, SCAG RTP/SCS

Freeway Construction Cost Estimates (SCAG RTP/SCS)				
Counties	2016-2020	2021-2025	2026-2030	Total 2016-2030 Costs
Los Angeles	\$16,037,920,000	\$14,051,669,000	\$5,347,696,000	\$35,437,285,000
Orange	4,561,804,000	-	2,419,044,000	6,980,848,000
San Bernardino	8,271,850,000	3,409,228,952	5,547,552,000	17,228,630,952
Riverside	3,131,576,000	5,476,784,000	2,784,322,000	11,392,682,000
Total Regional Costs	\$32,003,150,000	\$22,937,681,952	\$16,098,614,000	\$71,039,445,952

Source: Authors analysis of SCAG 2016 RTP/SCS project list, available at http://scagrtpscscs.net/Documents/2016/final/f2016RTPSCS_ProjectList.pdf.

Table 7: Transit Construction Cost Estimates, by County, 2016-2030, SCAG RTP/SCS

Transit Construction Cost Estimates (SCAG RTP/SCS)				
Counties	2016-2020	2021-2025	2026-2030	Total 2016-2030 Costs
Los Angeles	\$8,790,582,000	\$8,782,094,000	\$4,072,768,000	\$21,645,444,000
Orange	543,164,000	-	-	543,164,000
San Bernardino	44,080,000	185,452,000	149,265,000	378,797,000
Riverside	647,540,000	756,335,000	611,915,000	2,015,790,000
Total Regional Costs	\$10,025,366,000	9,723,881,000	4,833,948,000	\$24,583,195,000

Source: Authors analysis of SCAG 2016 RTP/SCS project list, available at http://scagrtpscscs.net/Documents/2016/final/f2016RTPSCS_ProjectList.pdf.

Tables 6 and 7 show neighboring counties (Los Angeles, Riverside, San Bernardino), and any project with OCTA as a lead agency was subtracted from totals in the above tables. OCTA's Next 10 plan is shown in Table 8. The OCBC team cautions against a direct comparison of Table 8 to Tables 6 and 7. The Next 10 plan includes projects with OCTA Measure M funding, but would exclude projects that do not receive such funding, and hence Table 8 is not a complete accounting of projects in Orange County. Table 9 shows OCTA costs from the 2016 RTP, for projects with OCTA as the lead agency (which are excluded from Tables 6 and 7.) Differences in project end dates, differences in the timing of the data, and differences in fund source create differences in the tables, particularly so when placing project spending into five-year windows. While the five-year summary is useful, it also assumes that all spending falls within the five-year window that contains the project completion date, which can be misleading (more discussion of this follows below) but was the best approach possible given the available data.

Table 8: OCTA Next 10 Delivery Plan Cost Phasing, 2016-2030 (based on project end dates)

Next 10 Project Construction Cost Estimates from Next 10 Plan				
Sector	2016-2020	2021-2025	2026-2030	Total 2016-2030 Costs
Freeways	\$1,731,440,801	\$1,751,074,028	\$761,976,213	\$4,244,491,043
Transit	747,864,728	557,208,964	624,258,500	1,929,332,192
Streets and Roads	687,083,897	574,777,031	597,036,839	1,858,897,767
Water / Environmental	27,459,164	40,775,606	49,345,968	117,580,738
Total Costs	\$3,193,848,589	\$2,923,835,629	\$2,032,617,521	\$8,150,301,739

Source: Authors analysis of OCTA Next 10 delivery plan, available at http://www.octa.net/pdf/M2_Next10DeliveryPlan.pdf.

Table 9: OCTA Freeway and Transit Project Costs from 2016 SCAG RTP/SCS, 2016-2030

OCTA Specific Costs from SCAG RTP/SCS				
	2016-2020	2021-2025	2026-2030	Total
Freeways	\$90,469,000	\$1,854,552,000	\$1,133,266,000	\$3,278,287,000
Transit	2,770,999,000	300,879,000	-	3,071,878,000
Total Costs	\$3,061,468,000	\$2,155,431,000	\$1,133,266,000	\$6,350,165,000

Source: Authors analysis of SCAG 2016 RTP/SCS project list, available at http://scagrtpscscs.net/Documents/2016/final/f2016RTPSCS_ProjectList.pdf.

Tables 6 and 7 illuminate overall patterns, even with the shortcomings inherent in comparing data based on project end date and different time periods. First, note that transportation construction spending from neighboring counties is substantial, with Los Angeles County programming approximately four to six times as much construction as Orange County in the 2016-2020 and 2021-2025 time periods (highlighted in Table 10 below). Riverside and San Bernardino Counties are pursuing construction programs that are at least as large as Orange County's Next 10 program.

Table 10: Regional Construction Costs for Freeways and Transit, 2016-2025

Overall Southern California Regional Construction Costs for 2016-2025 Period (Freeways and Transit)	
Los Angeles	\$47,662,265,000
San Bernardino	\$11,910,610,952
Riverside	\$10,012,235,000
Orange County Measure M (Next 10 Projects) Total	\$4,787,588,521
Orange County Overall Total¹⁰	\$9,892,556,521

Source: Authors analysis of SCAG 2016 RTP/SCS Project List available at http://scagrtpscscs.net/Documents/2016/final/f2016RTPSCS_ProjectList.pdf and Authors analysis of OCTA Next 10 delivery plan, available at http://www.octa.net/pdf/M2_Next10DeliveryPlan.pdf.

¹⁰ Orange County Overall Total may include potential double counting of some costs of certain construction projects from the SCAG RTP/SCS and Next 10 Delivery Plan and, as such, this total should be seen as the upper limit of overall construction costs in Orange County.

Some cautions are necessary. The data in Tables 6 through 10 allocate project costs based on completion dates. For projects in the 2016-2020 time period, contracts may have already been signed, staffing might be in place, and the cost pressure might be present and may have been for some time. The pattern in Tables 6 and 7 shows a higher level of spending in 2016-2020 and a drop-off in 2026-2030, and both are likely artifacts of the necessity of assigning project cost based on end year. For projects ending in 2016-2020 (some are likely now complete), assigning all costs to the current five-year window includes expenditures that were likely from earlier, before 2016, time periods. For 2026-2030, some projects with end dates after 2030 will likely be in progress, but those costs will not be included. Hence there should be caution against interpreting that expenditures in the region will decline during the time trend from 2016 through 2030.

OCBC's analysis reaches the following conclusions:

1. Expenditures in neighboring counties are large, and will be a source of potential price pressure for OCTA now and through the next ten years. While Los Angeles County's program is the largest, Riverside and San Bernardino are also pursuing ambitious transportation programs and will be a source of cost pressure.
2. The region's transportation program, through the next ten years, is more focused on highways than transit. OCTA, with a relatively highway focused program, might view highway programs as the primary competition for materials and labor. That focus may be too narrow – transit infrastructure likely uses some of the same materials and skilled labor as do highways. The analysis in Tables 6 and 7 shows that, regardless of assumptions about how transit construction competes for inputs with highway construction, the programs in neighboring counties provide more funds for highways than for transit.

On net, Tables 6 and 7 show that transit is approximately 26 percent of the projects with end dates between 2016 and 2030 in the three counties that border Orange County. That is a relatively highway-focused construction program. The OCBC team compared that to two other data sources. Los Angeles County's Measure M, passed in 2016, allocates 35 percent of its funds for transit construction, 17 percent for highway construction, and 16 percent to local return.¹¹ If local return is spent mostly on street and road projects, Measure M, the most recent sales tax measure in Los Angeles, will split roughly 50-50 across transit and highway construction, and other funds (state, federal) are consistent with more total expenditures on highway than on transit construction, even in Los Angeles County. Our analysis also examined the funding split for capital projects in the SCAG RTP, 2016 through 2030. Of those capital projects, 33.3 percent are

¹¹ Proposed Ordinance #16-01, Measure M, Los Angeles County Traffic Improvement Plan, available at http://theplan.metro.net/wp-content/uploads/2016/09/measurem_ordinance_16-01.pdf.

for transit and passenger rail, again suggesting that the bulk of SCAG region capital projects will be for roads and highways.¹²

Overall the SCAG region is in the midst of an ambitious capital construction program, with neighboring counties commissioning work that, in Riverside and San Bernardino, at least matches and, combined, exceeds the scale of Orange County. Los Angeles County's work program is approximately four to six times larger than Orange County's over the course of the 2016-2025 period. This creates the potential for substantial market pressures from demand for construction materials and skilled labor from neighboring county programs.

¹² Data on capital projects for SCAG region are from SCAG 2016 RTP, Transportation Finance appendix, Table 8, p. 20, available at http://scagrtpscscs.net/Documents/2016/final/f2016RTPSCS_TransportationFinance.pdf.

F. Increasing Construction Wage Pressure

Table 11 shows construction sector wages from the U.S. Bureau of Labor Statistics Quarterly Census of Employment and Wages for Los Angeles, Orange, Riverside, and San Bernardino Counties, 2012 to 2016.

Table 11: Construction Wages and Growth Rate, Orange and Neighboring Counties, 2012-2016

County	2012	2013	2014	2015	2016	% annual growth, 2012-2014	% annual growth, 2014-2016
Los Angeles	\$ 55,774.83	\$ 56,610.48	\$ 57,995.30	\$ 61,304.54	\$ 63,366.75	1.97%	4.53%
Orange	\$ 61,830.50	\$ 61,441.55	\$ 63,494.49	\$ 66,898.66	\$ 69,195.51	1.34%	4.39%
Riverside	\$ 48,063.63	\$ 48,520.23	\$ 50,358.97	\$ 53,819.94	\$ 55,834.20	2.36%	5.30%
San Bernardino	\$ 51,890.65	\$ 52,297.51	\$ 52,397.23	\$ 55,594.93	\$ 57,341.12	0.49%	4.61%

Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, NAICS codes 2362 (nonresidential building construction), 2361 (residential building construction), 237 (other heavy construction), 2382 (building equipment contractors), 2381 (building foundation and exterior contractors), 2383 (building finishing contractors), 2389 (other specialty trade contractors.)

Construction wage growth in all four counties has accelerated since 2014, likely reflecting labor demand pressures in those sectors. Since 2014, annualized wage growth has ranged from 4.39 percent (Orange) to 5.3 percent (Riverside). This reflects stronger wage growth than the national economy. The Federal Reserve Bank of Atlanta tracks wage growth, and has estimated that since 2014, monthly year-on-year wage growth in the national economy has ranged from 2.3 percent (January, 2014) to 3.9 percent (October, 2016).¹³

This is consistent with recent evidence that building construction, particularly in the Inland Empire, has accelerated.¹⁴ Historical data suggest that construction employment can expand or contract substantially with economic cycles, but periods of high construction employment have coincided with periods of high public sector infrastructure costs when measured by the Caltrans CCI. If the private sector economy continues to grow, coupled with the large public sector construction programs in southern California, pressure on construction wages and hence on public sector construction costs will likely increase.

¹³ The Federal Reserve Bank of Atlanta national wage tracker is available at <https://www.frbatlanta.org/chcs/wage-growth-tracker.aspx?panel=1>.

¹⁴ The Orange County Register reported in May of 2017 that Riverside and San Bernardino Counties added 12,200 construction jobs, year on year, as of March 2017. See Jonathan Lansner, "California, Inland Empire in building booms: 6 things to know," Orange County Register, May 2, 2017, available at <http://www.ocregister.com/2017/05/02/california-inland-empire-in-building-booms-6-things-to-know/>.

Apprenticeship programs and other education and training programs such as those offered by community colleges can help build the pipeline of skilled construction labor, and hence mitigate construction cost pressures. The construction industry has an extensive internship tradition. Approximately two-thirds of all apprenticeships registered with the U.S. Department of Labor are in the construction industry.¹⁵ Seventy-four percent of all construction apprenticeships are represented by the North America's Building Trades Unions (NABTU), which operates apprenticeship programs through approximately a billion dollars of funding nationally in more than 1,600 teaching centers.¹⁶

Locally, the Los Angeles and Orange Counties Building and Construction Trades Council is an umbrella association representing 48 local unions and district councils in 48 trades and over 100,000 members.¹⁷ Given that public sector construction is often unionized, the Building and Construction Trades Council could be a possible partner in launching or expanding apprenticeship programs aimed at the public works market. Such apprenticeship programs would be particularly appropriate given the prospects for continued sustained demand for public works construction.

G. Recession

The current economic expansion is eight years old.¹⁸ A recession during the ten-year extended Next 10 forecasting window is likely if historic patterns of economic expansion and contraction are any guide. Yet timing such an economic contraction is highly difficult, and beyond the scope of this research. A recession will slow demand for residential construction, and exert downward cost pressure on public works projects, but that effect will be countervailed by the large public works programs in Los Angeles and neighboring counties. Those programs are not immune from economic contractions – sales tax revenues typically drop during recessions. But the base level of public sector infrastructure spending in Southern California will be high due to county sales tax infrastructure construction programs regardless of the status of the business cycle.

These risk factors, and possible OCTA mitigating actions, are summarized in Table 12 below:

Table 12: Risk Factors, Effect on Public Works Costs, and Some Possible OCTA Mitigations

¹⁵ Case Western Reserve University and U.S. Department of Commerce, *The Benefits and Costs of Apprenticeship: A Business Perspective*, Nov., 2016, p. 65, available at <http://www.esa.gov/sites/default/files/the-benefits-and-costs-of-apprenticeships-a-business-perspective.pdf>.

¹⁶ Ibid.

¹⁷ See <http://laocbuildingtrades.org/about-building-trades/>.

¹⁸ According to the National Bureau of Economic Research, which dates business cycles and hence recession start and end dates, the Great Recession ended in June of 2009. See <http://www.nber.org/cycles.html>.

Risk Factor	Impact on Costs	Likelihood	Comments	Possible OCTA Mitigations
Sustained low unemployment	Increases costs beyond Table 5 model prediction	Likely in the next 2 to 5 years	Wage pressure is still low, suggests that the economy has continued room to expand without necessitating policy efforts (i.e. interest rate increases) that would induce a recession	Accelerate the next 2 to 3 years of the Next 10 plan. Increase the supply of contractors.
Increased Building Permitting (and hence residential construction)	Increases costs	Unlikely given long-term political factors, but regulatory change could be sudden	Increasing permitting depends in part on state or local political changes, but Inland Empire construction has been increasing rapidly	Accelerate next 2 to 3 years of the Next 10 plan. Labor force training to increase supply of skilled construction labor.

Risk Factor	Impact on Costs	Likelihood	Comments	Possible OCTA Mitigations
Continued Consolidation in Construction and Architecture/Engineering Industry	Increases costs in near-term, then pressure for costs to remain high	Likely, given recent consolidation trends	The industry has been consolidating. Unclear whether that trend has played out or will continue.	<p>OCTA becomes a preferred client</p> <p>Reduce barriers to new entrants into OCTA bid process</p> <p>Innovate in ease of doing business with OCTA</p>
Interest Rate Increases	Short-term cost increases as financing costs, for OCTA and contractors, increase – long-term downward cost pressure if recession ensues	Highly likely to have moderate interest rate increases in next 2 to 5 years	U.S. is near historically low interest rates; global savings glut will exert downward pressure on interest rates; on net, rate increases likely to be moderate and sustained	Complete financing agreements in the near-term to avoid higher interest rates

Risk Factor	Impact on Costs	Likelihood	Comments	Possible OCTA Mitigations
Neighboring County Transportation Programs Exert Cost Pressure	Increases Costs	Highly Likely; current work programs in neighboring counties meet or exceed level in Orange County	Recent self-help sales tax increases “lock in” sustained demand for public works contractors in Southern California	<p>OCTA becomes a client of choice</p> <p>Simplify the bid process and process of doing business with OCTA</p> <p>Accelerate Next 10 plan to lock in prices before peak market pressure from neighboring counties</p>
Increasing Construction Wage Pressure	Increases Costs	Likely in foreseeable future, unless residential market reverses course (which would likely coincide with a recession)	Construction wages increases by from 4.39 to 5.3 percent annually, 2014 to 2016, in Orange and neighboring SCAG region counties	<p>Accelerate Next 10 plan in advance of additional increases in construction wages</p> <p>Support efforts to increase the pool of construction labor</p>

Risk Factor	Impact on Costs	Likelihood	Comments	Possible OCTA Mitigations
Recession	Decreases Costs	Likely within the next 10 years, but timing highly uncertain	Recession will reduce demand for private sector residential and commercial construction, but public sector demand will remain although sales tax revenues will drop in a recession	Timing uncertainty makes mitigation measures, beyond those listed above, difficult to implement.

The risk factors above create cost pressures that are in opposing directions, with varying possible timing and certainty, and with varying mitigation measures that may, in some cases, be at odds with each other. Our research judges the most likely risk factors (near-term) to be sustained low unemployment, increases in residential construction, cost pressure from neighboring county public works programs, and increasing construction wage pressure. . All are features of today's environment. The largest risk, in terms of magnitude on public works costs, would be changes in the residential construction regulatory environment – an unlikely outcome but one that has the potential to create large cost pressures if that leads to a residential building boom. Such a regulatory risk hinges on political factors, and our analysis suggests that OCTA monitor the politics surrounding the regulatory approval process for residential permitting and construction. Note that changes that simplify or speed the project approval process could lower OCTA's costs, and the increased cost pressure from residential building if permitting and approvals became easier could be countervailed by lower costs to OCTA from more rapid approval of the agency's projects.

The OCBC analysis predicts cost pressures that will remain high, with the potential for cost increases that exceed model predictions at least in the near-term (next 2 to 5 years). When possible, OCTA might accelerate the first five years of the Next 10 Plan to avoid cost increases. Our analysis notes that significant additional near-term acceleration in the Next 10 Plan may be unrealistic, given that OCTA has worked to accelerate projects to the extent possible. More importantly, the supply of public works contractors and competition for their services promises to be a key cost factor going forward. For that reason, OCTA should do what it can to increase the supply of bidders for projects, doing what it can to remain a preferred client for public works contractors.

III. Cost Factor Analysis

OCBC collected data from 1983 through 2016, annually, for cost factors from two data sources – Caltrans and Engineering News Record (ENR). As with the indices analyzed in the previous section, the Caltrans data are for the entire state, and the ENR data are for the Los Angeles metropolitan area. The Caltrans data are from bids, and reflect data for public works transportation projects from what can be relatively small samples. The ENR data are from a survey of businesses, and represent private sector construction costs better, but each ENR cost factor is from one supplier, limiting the ability of the ENR data to reflect market averages. In many cases, materials costs across public and private sector jobs may be the same, but differences in contracting practices, the size of the job, and the timespan of the project could lead to differences in buying power across public and private entities.

Table 13 lists the Caltrans cost factor data, with units shown in the column headers, and Table 14 lists the ENR cost factor data, also with units in the column headers.

Table 13: Caltrans Cost Factors, 1983 through 2016, State of California

<i>Year</i>	<i>Roadway Excavation (\$/Cu Yd)</i>	<i>Aggregate Base (\$/Ton)</i>	<i>Asphalt Concrete Pavement (\$/Ton)</i>	<i>PCC Pavement (\$/Cu Yd)</i>	<i>Class A PCC Structure (\$/Cu Yd)</i>	<i>Bar Reinforcing Steel (\$/Lb)</i>	<i>Structural Steel (\$/Lb)</i>
1983	2.1	9.2	27.57	52.04	225.84	0.335	2.155
1984	3.19	13.67	28.38	55.79	238.48	0.375	2.155
1985	2.77	11.55	30.15	64.13	232.39	0.413	2.288
1986	3.01	12.76	28.82	60.49	249.74	0.412	2.388
1987	2.97	17.57	27.54	70.62	280.4	0.418	2.546
1988	4.16	10.13	27.46	58.66	284.55	0.44	3.956
1989	4.19	10.62	29.43	73.78	303.49	0.483	3.103
1990	4.73	12.05	30.77	68.93	295.24	0.469	2.209
1991	3.08	10.07	33.43	62.64	295.21	0.431	2.284
1992	3.62	9.76	32.46	66.78	265.31	0.419	3.073
1993	4.53	9.89	35.41	66.76	243.79	0.464	2.706
1994	4.68	10.39	37.15	66.45	277.92	0.547	2.334
1995	4.1	10.18	35.29	63.85	298.8	0.499	2.266
1996	3.8	9.74	37.66	65.93	321.88	0.512	2.172
1997	5.25	10.29	36.07	78.48	308.54	0.496	2.337
1998	4.95	11.55	38.78	75.91	319.95	0.553	2.595
1999	6.55	12.86	40.14	77.95	321.22	0.521	3.215
2000	6.21	11.14	45.12	78.14	363.59	0.507	2.754
2001	5.83	14.58	43.89	75.74	425.17	0.612	3.906
2002	4.84	12.42	49	74.15	363.5	0.508	3.248
2003	5.05	15.05	48.35	109.96	362.75	0.6	1.71
2004	13.11	16.97	53.55	135.94	399.64	0.947	5.39
2005	14.13	20.61	75.72	171.22	567.31	0.968	2.666
2006	12.8	20.26	86.04	179.67	630.16	1.039	3.734
2007	10.84	20.54	85.48	204.69	566.25	0.935	6.966
2008	11.39	17.9	78.5	177.91	553.62	0.938	5.183
2009	9.37	14.91	80.38	125.41	484.78	0.593	4.492
2010	7.94	14.2	80.25	122.82	483.64	0.716	2.149
2011	11.82	14.12	87.11	135.4	427.76	0.83	2.102
2012	8.24	14.66	89.36	132.52	461.23	0.927	2.497
2013	8.98	18.6	100.11	157.26	538.01	1.01	5.57
2014	17.49	23.1	96.97	206.22	660.64	1.12	10.132
2015	15.87	22.85	105.09	194.14	652.86	1.2	15.54
2016	21.1	25	121.43	210.83	702.98	1.62	19.62

Source: California Department of Transportation, Highway Construction Price Index Reports;
http://www.dot.ca.gov/hq/esc/oe/hist_price_index.html

Table 14: Engineering News Record Cost Factors, 1983 – 2016, Los Angeles Metropolitan Area

Year	Asphalt Average (\$/Ton)	Portland Cement (\$/Ton)	Gravel (>3/4 Inch; \$/Ton)	Gravel (<3/4 inch; \$/Ton)	Crushed Stone (\$/ Ton)	Sand Concrete (\$/Ton)	Std. Structural Shapes (\$/CWT)	I-Beams (\$/CWT)	Reinforcing Bars (\$/CWT)
1983	165.00	66.06	5.40	5.47	3.97	6.18	42.63	44.63	14.00
1984	173.00	62.75	7.67	7.82	8.15	7.88	43.42	45.14	13.66
1985	180.50	63.86	7.93	8.01	8.23	8.04	43.40	44.82	12.97
1986	187.00	63.93	8.05	8.07	8.32	8.13	43.49	44.87	13.02
1987	196.00	63.94	8.20	8.19	8.44	8.30	43.69	45.01	12.25
1988	163.55	65.95	8.23	8.24	7.70	8.33	34.01	35.94	14.81
1989	115.10	66.40	8.20	8.25	6.97	8.35	25.65	28.77	17.80
1990	118.08	66.75	8.38	8.48	7.03	8.40	25.72	28.90	17.93
1991	115.50	64.93	8.65	8.58	6.99	8.35	26.33	28.78	18.15
1992	94.63	63.48	8.78	8.08	6.68	6.68	23.77	24.70	18.90
1993	96.93	63.85	9.15	8.65	6.94	6.10	23.10	23.68	21.43
1994	108.95	63.58	9.20	8.72	7.36	6.25	24.62	25.83	23.90
1995	115.04	65.55	9.28	9.05	7.20	6.33	25.80	25.91	25.90
1996	120.23	70.84	9.70	9.31	7.45	6.56	26.32	24.47	27.00
1997	128.07	74.11	9.86	9.68	7.67	6.63	26.48	25.20	26.86
1998	134.74	76.91	9.92	9.56	7.76	6.97	27.30	27.11	26.79
1999	125.42	77.91	9.83	8.87	7.94	6.90	27.03	26.86	25.60
2000	126.61	79.04	9.42	8.66	8.13	6.94	26.83	26.88	26.57
2001	145.03	79.63	9.35	8.86	7.82	6.97	27.11	27.02	27.33
2002	147.19	81.02	9.93	9.66	7.96	7.10	26.97	27.24	26.08
2003	165.35	81.99	10.94	10.20	8.02	7.48	26.15	25.96	24.91
2004	175.34	82.48	10.81	10.25	8.09	7.52	29.51	29.74	29.57
2005	214.55	86.41	10.26	10.41	8.30	7.63	32.98	34.03	34.40
2006	232.28	88.77	10.50	10.46	8.44	7.94	35.52	37.31	35.52
2007	268.39	94.60	10.52	10.41	8.55	8.05	38.25	39.97	35.99
2008	283.31	98.00	10.50	10.04	8.90	8.29	42.83	44.17	39.16
2009	284.26	98.02	10.50	10.01	8.90	8.30	45.49	46.71	41.41
2010	284.26	98.02	10.50	10.01	8.93	8.30	45.49	46.71	41.41
2011	284.26	98.02	10.50	10.01	8.93	8.30	43.97	42.85	32.78
2012	309.57	101.76	10.65	10.36	8.93	8.68	43.62	42.34	31.99
2013	345.00	107.00	10.87	10.86	8.93	9.20	43.40	42.18	31.97
2014	345.00	107.00	10.87	10.86	8.93	9.20	43.45	42.23	32.03
2015	348.83	112.79			8.95	9.25	44.75	43.18	34.23
2016	358.52	114.90			9.25	9.22	49.74	50.73	45.00

Source: Engineering News Record Construction Economics Archive, http://www.enr.com/economics/current_costs

Graphing these cost factor trends over time is instructive, but because that involves seven graphs for the Caltrans cost factors and nine graphs for the ENR cost factors, those graphs are shown in Figures A6 through A21 of the appendix. Figures A6 through A12 display the Caltrans cost factors over time, and Figures A13 through A21 show the time trend of the ENR cost factors. Each figure shows the cost factors normalized to 100 in the beginning year of 1983, so that later years can be quickly interpreted as a percentage of the 1983 value. Each figure also shows the normalized building permit data, 1983 through 2016, for visual comparison with the cost factor time trend. Building permit data are for California when shown on the Caltrans cost factor graphs and for the Los Angeles metropolitan area when shown for the ENR cost factor graphs.

Some trends are evident from Appendix Figures A6 through A21. First, the cost factors increase after 2012 or 2013 – a trend that is consistent with the Caltrans CCI trend. The Caltrans cost factors show rapid increases after 2012, with the largest percentage increases for roadway excavation costs and structural steel (Figures A6 and A12, respectively.) The ENR cost factors also increase starting around 2012, but the increase is smoother and more modest than for the Caltrans cost factors. For the ENR cost factors, those related to steel (Figures A19 through A21) show the largest percentage increases, qualitatively consistent with the Caltrans information, although the magnitude of increases are generally smaller in the ENR cost factors. The smoother ENR trend is likely due to the fact that ENR samples one supplier of each cost factor, and individual suppliers likely change prices smoothly over time.

The individual cost factors do not display trends that are qualitatively different from the Caltrans CCI, ENR CCI, or BCI indices. Those indices are formed from the cost factors, so this is not surprising. Also, the individual cost factors show little visual relationship to building permitting activity in recent years. For both reasons, there is little reason to believe that forecasting models for individual cost factors will give insights beyond the forecasting model for the indices. For that reason, OCBC believes that an analysis of risk and uncertainties in the overall market is more important, and readers should refer to the risk analysis in Section II.

IV. Recommendations and Indicators

Going forward, risk management will be complex but important for OCTA's Next 10 Plan. OCBC suggests that OCTA develop a set of data indicators that function as an early warning system, alerting the agency to possible changes in risk factors. The following are a list of possible indicators to consider, with suggested frequency shown in parentheses:

- Overall employment/unemployment trends from the California Employment Development Department (EDD) (monthly)
- Federal Research Labor Market Conditions Index (monthly)
- Employment in construction jobs, based on the NAICS codes used in Table 11, Bureau of Labor Statistics' Quarterly Census of Employment and Wages and EDD (quarterly)

- Data on wages in construction jobs, based on the NAICS codes in Table 11, from the Bureau of Labor Statistics' Quarterly Census of Employment and Wages (quarterly)
- Building permit data, focused on Los Angeles, Orange, Riverside, San Bernardino Counties (quarterly)
- Number of bidders on County Transportation Commission projects (quarterly)
- Executive opinion from the California State University Fullerton Orange County Business Expectations (OCBX) Survey (quarterly)
- Chapman University Orange County Composite Index (quarterly)
- Chapman University Consumer Sentiment Index
- Commercial and industrial vacancies, CoStar (quarterly)
- Commodity prices, focused on aggregate base, concrete and PCC pavement, and bar and structural steel, from Caltrans (statewide) and from Los Angeles (ENR), (quarterly)

Of these data, the number of bidders would require collaboration between OCTA and agencies in neighboring counties. If appropriate, OCBC suggests exploring such data sharing, to the extent feasible and allowed by law, so that agencies can see trends in the number of bids and hence any effect of industry consolidation.

More generally, the development of a data tracking system will be important in allowing OCTA to identify trends early to assess how risks are changing. In the next several years, increasing cost pressures will likely dominate factors that would tend to reduce costs.

IV. Appendix

Appendix Table A-1: California Department of Transportation Construction Cost Index (CCI), California Building Permits, Population, Employment, Total Annual Payrolls and Per Capita Personal Income Levels and Normalized (1983-2016)

California Department of Transportation Construction Cost Index (CCI), California Building Permits, Population, Employment, Total Annual Payrolls and Per Capita Personal Income Levels (1983-2016)						
	Caltrans CCI	Building Permits	Population	Employment	Total Annual Payroll	PCPI
1983	31	172,569	25,337,000	11,372,808	195,054,946,160	14,538
1984	36.2	224,845	25,816,000	11,765,867	216,618,428,420	15,864
1985	36	272,317	26,402,000	12,125,483	236,522,988,980	16,767
1986	37.3	314,569	27,052,000	12,440,467	255,170,888,000	17,573
1987	39.7	253,171	27,717,000	12,870,917	279,366,221,300	18,491
1988	40.5	255,559	28,393,000	13,233,408	302,871,575,460	19,606
1989	43.9	237,747	29,142,000	13,583,867	324,027,212,800	20,576
1990	44.1	164,313	29,828,496	14,264,200	346,973,875,947	21,494
1991	40.4	105,919	30,458,613	13,960,000	351,494,177,154	21,824
1992	40.4	97,407	30,987,384	13,880,900	362,212,067,130	22,644
1993	42.2	84,656	31,314,189	13,817,000	363,604,887,659	22,964
1994	46.2	97,047	31,523,690	13,944,700	373,510,553,612	23,535
1995	45	85,293	31,711,849	14,048,200	392,794,301,814	24,595
1996	45.6	94,283	31,962,949	14,300,400	417,660,266,084	25,885
1997	47.6	111,716	32,452,789	14,784,600	453,907,544,517	27,147
1998	49.9	125,707	32,862,965	15,184,500	496,463,173,957	29,133
1999	52.9	140,137	33,418,578	15,555,300	541,647,241,978	30,663
2000	53.5	148,540	34,000,835	16,033,200	615,026,413,391	33,391
2001	58.7	145,757	34,512,742	16,197,700	619,146,651,267	34,091
2002	53.1	167,761	34,938,290	16,108,700	614,542,438,304	34,306
2003	56.6	195,682	35,388,928	16,102,800	630,692,095,035	35,381
2004	79.1	212,960	35,752,765	16,304,000	667,521,587,162	37,244
2005	98.1	208,972	35,985,582	16,582,700	703,992,717,929	39,046
2006	104.1	164,280	36,246,822	16,789,400	749,504,649,781	41,693
2007	100	113,034	36,552,529	16,931,600	790,444,530,437	43,182
2008	95	64,962	36,856,222	16,854,500	797,791,743,140	43,786
2009	78.4	36,421	37,077,204	16,182,600	754,405,951,731	41,588
2010	76.4	44,762	37,253,956	16,091,900	768,071,900,576	42,411
2011	84	47,343	37,674,954	16,258,100	801,387,207,989	44,852
2012	79.2	59,225	38,041,489	16,602,700	849,471,063,227	47,614
2013	97.09	85,472	38,373,434	16,958,700	878,441,319,278	48,125
2014	108.32	85,844	38,739,410	17,348,600	933,404,857,793	49,985
2015	122.02	98,233	39,059,809	17,723,300	1,005,383,368,506	52,651
2016	140.75	100,265	39,354,432	18,065,000	N/A	55,987

Source: U.S. Census Bureau, California Employment Development Department, U.S. Bureau of Economic Analysis

Appendix Table A-1 Continued

California Department of Transportation Construction Cost Index (CCI), California Building Permits, Population, Employment, Total Annual Payrolls and Per Capita Personal Income Normalized (1983-2016)						
	Caltrans CCI	Building Permits	Population	Employment	Total Annual Payroll	PCPI
1983	100	100	100	100	100	100
1984	116.8	130.3	101.9	103.5	111.1	109.1
1985	116.1	157.8	104.2	106.6	121.3	115.3
1986	120.3	182.3	106.8	109.4	130.8	120.9
1987	128.1	146.7	109.4	113.2	143.2	127.2
1988	130.6	148.1	112.1	116.4	155.3	134.9
1989	141.6	137.8	115.0	119.4	166.1	141.5
1990	142.3	95.2	117.7	125.4	177.9	147.8
1991	130.3	61.4	120.2	122.7	180.2	150.1
1992	130.3	56.4	122.3	122.1	185.7	155.8
1993	136.1	49.1	123.6	121.5	186.4	158.0
1994	149.0	56.2	124.4	122.6	191.5	161.9
1995	145.2	49.4	125.2	123.5	201.4	169.2
1996	147.1	54.6	126.2	125.7	214.1	178.1
1997	153.5	64.7	128.1	130.0	232.7	186.7
1998	161.0	72.8	129.7	133.5	254.5	200.4
1999	170.6	81.2	131.9	136.8	277.7	210.9
2000	172.6	86.1	134.2	141.0	315.3	229.7
2001	189.4	84.5	136.2	142.4	317.4	234.5
2002	171.3	97.2	137.9	141.6	315.1	236.0
2003	182.6	113.4	139.7	141.6	323.3	243.4
2004	255.2	123.4	141.1	143.4	342.2	256.2
2005	316.5	121.1	142.0	145.8	360.9	268.6
2006	335.8	95.2	143.1	147.6	384.3	286.8
2007	322.6	65.5	144.3	148.9	405.2	297.0
2008	306.5	37.6	145.5	148.2	409.0	301.2
2009	252.9	21.1	146.3	142.3	386.8	286.1
2010	246.5	25.9	147.0	141.5	393.8	291.7
2011	271.0	27.4	148.7	143.0	410.9	308.5
2012	255.5	34.3	150.1	146.0	435.5	327.5
2013	313.2	49.5	151.5	149.1	450.4	331.0
2014	349.4	49.7	152.9	152.5	478.5	343.8
2015	393.6	56.9	154.2	155.8	515.4	362.2
2016	454.0	58.1	155.3	158.8	N/A	385.1

Source: U.S. Census Bureau, California Employment Development Department, U.S. Bureau of Economic Analysis

Appendix Table A-2: Engineering News Record Construction Cost Index (CCI) and Building Cost Index (BCI), 1983-2016; Levels and Normalized Data to 1983

Engineering News Record Construction Cost Index (CCI) and Building Cost Index (BCI), 1983-2016; Levels and Normalized Data to 1983				
	CCI	BCI	CCI (Normalized)	BCI (Normalized)
1983	5063.9	2586.6	100.0	100.0
1984	5259.9	2726.4	103.9	105.4
1985	5446.7	2664.6	107.6	103.0
1986	5452.2	2762.6	107.7	106.8
1987	5474.1	2816.5	108.1	108.9
1988	5770.8	2851.7	114.0	110.2
1989	5789.8	2855.3	114.3	110.4
1990	5994.6	3020.5	118.4	116.8
1991	6090.1	3097.8	120.3	119.8
1992	6348.6	3198.7	125.4	123.7
1993	6477.8	3334.4	127.9	128.9
1994	6533.0	3420.4	129.0	132.2
1995	6526.2	3427.3	128.9	132.5
1996	6558.4	3426.7	129.5	132.5
1997	6663.6	3560.5	131.6	137.7
1998	6852.0	3617.0	135.3	139.8
1999	6826.0	3591.0	134.8	138.8
2000	7068.0	3680.3	139.6	142.3
2001	7226.9	3694.2	142.7	142.8
2002	7402.8	3787.8	146.2	146.4
2003	7531.8	3847.3	148.7	148.7
2004	8192.1	4155.2	161.8	160.6
2005	8346.9	4274.2	164.8	165.2
2006	8640.5	4489.9	170.6	173.6
2007	8979.1	4744.4	177.3	183.4
2008	9410.6	4950.4	185.8	191.4
2009	9779.4	5076.3	193.1	196.3
2010	9906.0	5182.7	195.6	200.4
2011	10057.0	5379.8	198.6	208.0
2012	10258.7	5493.8	202.6	212.4
2013	10454.6	5553.8	206.5	214.7
2014	10740.0	5671.1	212.1	219.3
2015	11075.6	5762.0	218.7	222.8
2016	11247.8	5907.1	222.1	228.4

Source: Engineering News Record Monthly Release

Appendix Table A-3: Regression of California Department of Transportation Construction Cost Index (CCI) on California Building Permits, California Employment, California Total Annual Wages and California Population; Levels and Changes Models

Dependent Variable = California Department of Transportation Construction Cost Index (1983-2016)				
	Levels Model		Changes Model	
Caltrans CCI	Coefficient	t-statistic	Coefficient	t-statistic
CCI _{t-1}	0.5790417	1.83	1.112234	5.43
CCI _{t-2}	-0.2159114	-0.72	0.054816	0.27
California Building Permits (BP)	2.28e-06	0.03	7.56E-05	1.75
BP _{t-1}	0.0000436	0.53	0.000079	1.75
BP _{t-2}	0.000063	0.94	-5.29E-06	-0.12
California Employment (EMP)	-3.34e-06	-0.33	0.000012	1.55
EMP _{t-1}	-0.0000108	-0.91	2.26E-06	0.26
EMP _{t-2}	3.66e-06	0.40	6.09E-06	0.75
California Total Annual Wages	1.34e-10	1.20	2.65E-11	0.29
WAGE _{t-1}	7.32e-11	0.52	1.08E-10	1.27
WAGE _{t-2}	-1.33e-10	-1.27	-2.33E-10	-2.23
California Population (POP)	-0.0000203	-1.08	-2.4E-05	-1.67
POP _{t-1}	0.0000227	0.84	-7.52E-06	-0.50
POP _{t-2}	1.78e-06	0.10	4.38E-05	3.55
_Cons	5.415306	0.04	-14.1453	-1.88

Sample Size:	31	30
R-Squared:	0.9719	0.9795

Appendix Table A-4: Engineering News Record Construction Cost Index (CCI) and Building Cost Index (BCI) Regressed on Building Permits, Employment, Total Annual Wages, and Population, Los Angeles Metropolitan Area; Levels and Changes Models

Dependent Variable = Engineering News Record Construction Cost Index and Building Cost Index (1983-2016)				
	Coefficient			
	ENR CCI Levels	ENR CCI Changes	ENR BCI Levels	ENR BCI Changes
CCI ENR _{t-1} / BCI ENR _{t-1}	0.4785932	0.8609058	0.2031473	0.9382157
CCI ENR _{t-2} / BCI ENR _{t-2}	0.2711119	0.1763995	0.3854375	0.0771721
LAMSA Bldg Permits (BP_LA)	0.0004867	0.0006004	-0.0018291	-0.0002938
BP_LA _{t-1}	-0.0021584	-0.0008503	0.001916	0.0007705
BP_LA _{t-2}	-	0.0021532	-	0.0012561
LA MSA Employment (EMP)	-0.0003014	-0.0004747	-0.0002912	-0.000429
EMP _{t-1}	-0.0001717	-0.0004079	-0.000387	-0.0001544
EMP _{t-2}	0.0002593	-0.0001594	0.0001608	-0.0002407
LA MSA Total Wages	5.76e-09	6.12e-09	4.14e-09	5.75e-09
WAGE _{t-1}	7.02e-09	8.87e-09	7.22e-09	3.77e-09
WAGE _{t-2}	-4.76e-09	6.85e-09	-3.22e-09	2.95e-09
LA MSA Population (POP)	0.0000273	0.0000507	0.0000499	0.0000524
POP _{t-1}	-0.0000583	-0.0000105	-0.0000185	-6.58e-06
POP _{t-2}	-0.0000624	0.0000247	-0.0000483	0.000013
_Cons	3099.81	-211.7501	3302.414	-25.03666
Sample Size:	31	30	31	30
R-Squared:	0.9974	0.9965	0.9982	0.9967

	t-statistics (corresponding to above coefficients)			
	ENR CCI Levels	ENR CCI Changes	ENR BCI Levels	ENR BCI Changes
CCI ENR _{t-1} / BCI ENR _{t-1}	2.06	3.49	0.73	2.95
CCI ENR _{t-2} / BCI ENR _{t-2}	1.25	0.69	1.89	0.23
LAMSA Bldg Permits (BP_LA)	0.22	0.29	-1.50	-0.22
BP_LA _{t-1}	-0.79	-0.35	1.47	0.61
BP_LA _{t-2}	-	0.91	-	0.94
LA MSA Employment (EMP)	-0.58	-0.94	-1.21	-1.58
EMP _{t-1}	-0.27	-0.69	-1.25	-0.45
EMP _{t-2}	0.73	-0.40	0.95	-1.10
LA MSA Total Wages	0.87	0.84	1.41	1.47
WAGE _{t-1}	0.74	1.06	1.52	0.78
WAGE _{t-2}	-0.75	0.97	-1.07	0.76
LA MSA Population (POP)	0.43	0.83	1.66	1.57
POP _{t-1}	-0.83	-0.15	-0.54	-0.17
POP _{t-2}	-0.98	0.38	-1.48	0.38
_Cons	1.49	-1.33	2.86	-0.30

Note: “—” indicates variable dropped due to collinearity

Appendix Table A-5: California Unemployment Rate Forecasts from California Legislative Analyst's Office, California Department of Finance and California Department of Transportation, 2017-2022

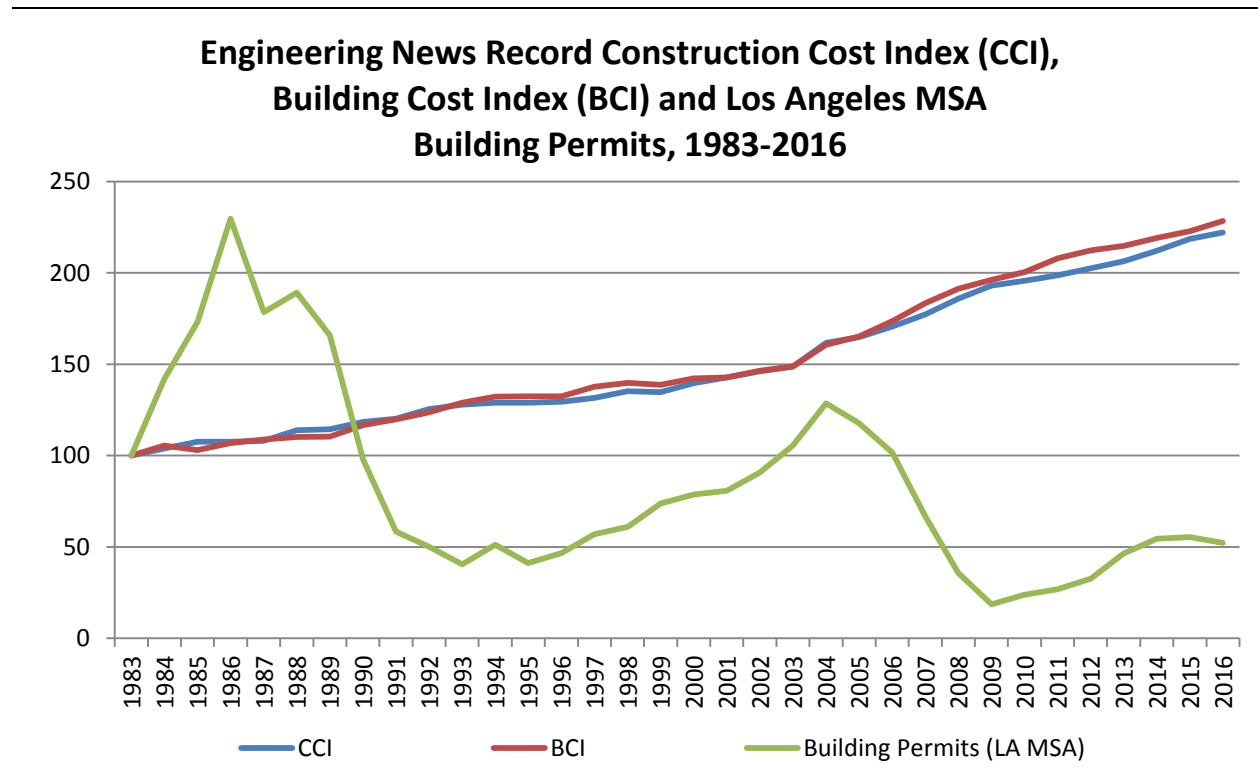
California Unemployment Rate Forecasts (2017-2022)						
	2017	2018	2019	2020	2021	2022
California Legislative Analyst's Office ¹⁹	5.3%	5.2%	-	-	-	-
California Department of Finance ²⁰	5.1%	5.0%	5.0%	5.0%	-	-
California Department of Transportation ²¹	4.9%	5.0%	5.0%	5.1%	5.0%	5.0%

¹⁹ <http://www.lao.ca.gov/reports/2016/3507/Fiscal-outlook-111616.pdf>

²⁰ http://www.dof.ca.gov/Forecasting/Economics/Eco_Forecasts/Us_Ca/index.html

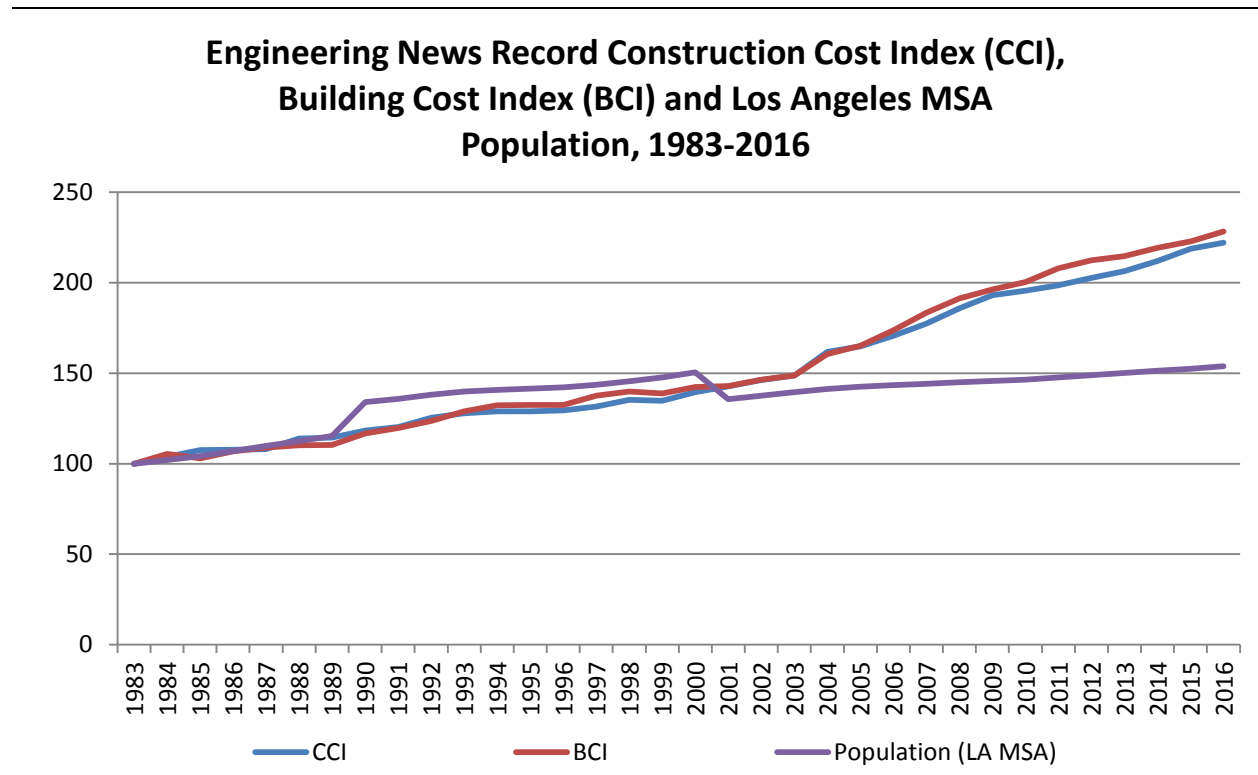
²¹ http://www.dot.ca.gov/hq/tpp/offices/eab/index_files/2016/FullReport2016.pdf

Appendix Figure A-1: Engineering News Record Construction Cost Index (CCI), Building Cost Index (BCI) and Los Angeles Metropolitan Statistical Area Building Permits (1983-2016); Normalized to 1983



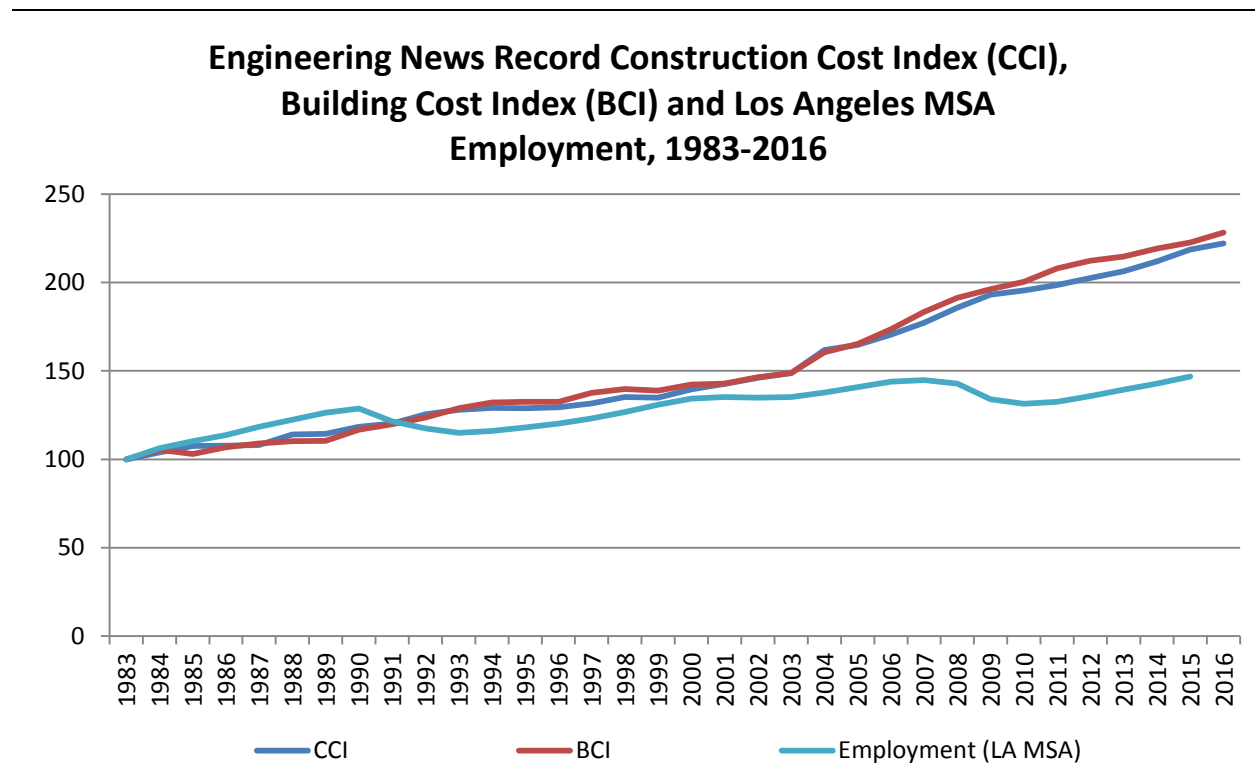
Source: Engineering News Record Monthly Release, U.S. Census Bureau Building Permit Survey

Appendix Figure A-2: Engineering News Record Construction Cost Index (CCI), Building Cost Index (BCI) and Los Angeles Metropolitan Statistical Area Population (1983-2016); Normalized to 1983



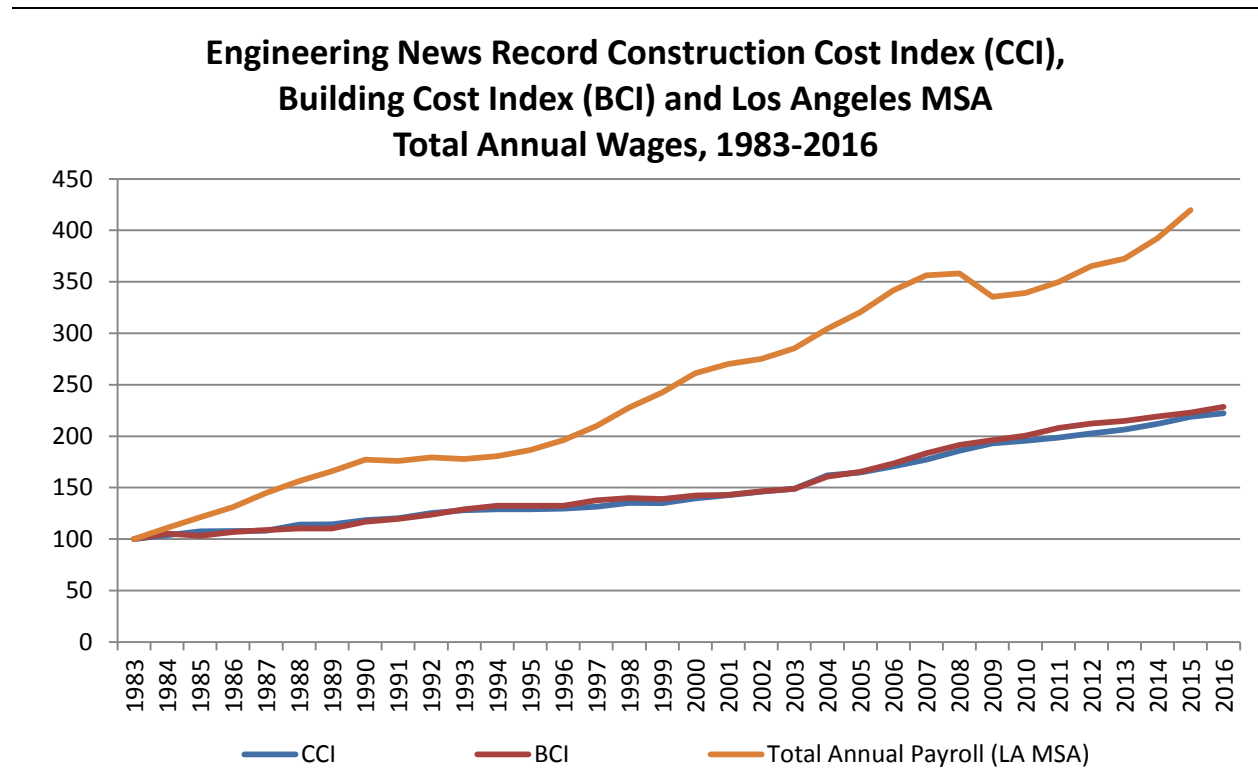
Source: Engineering News Record Monthly Release, U.S. Census Bureau

Appendix Figure A-3: Engineering News Record Construction Cost Index (CCI), Building Cost Index (BCI) and Los Angeles Metropolitan Statistical Area Employment (1983-2016); Normalized to 1983



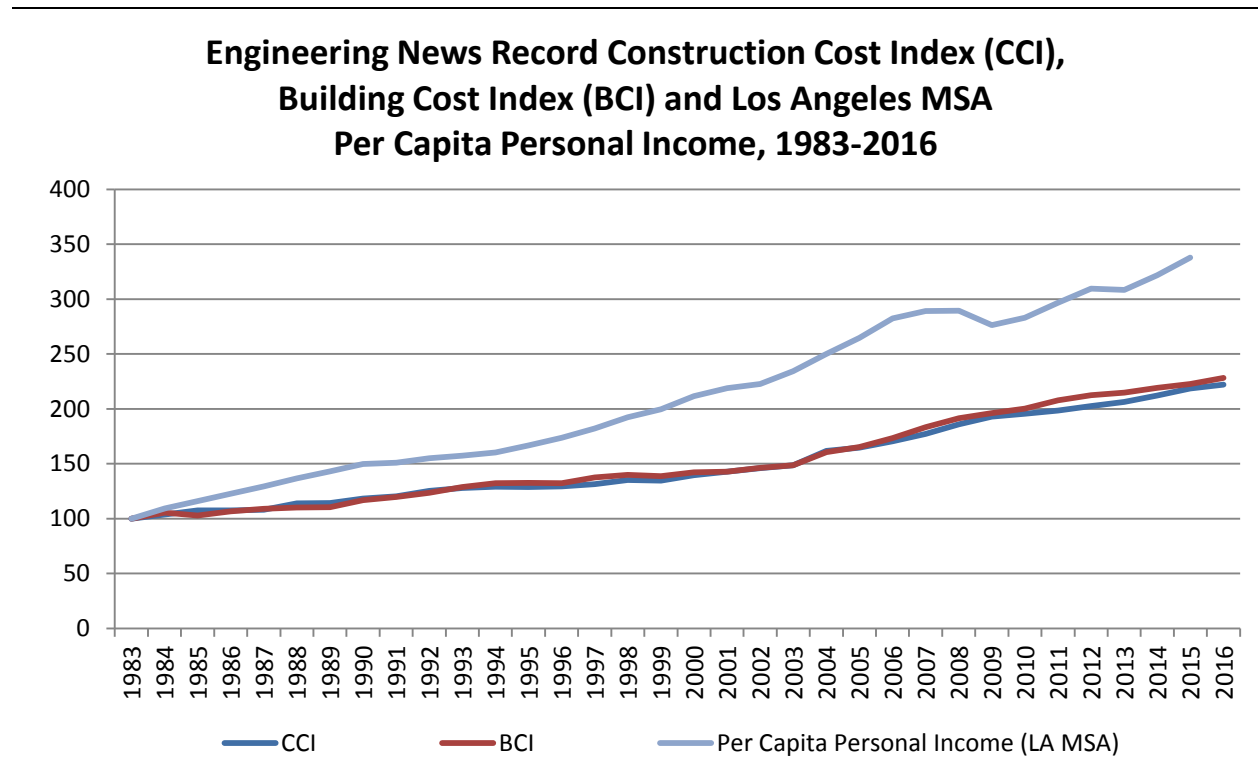
Source: Engineering News Record Monthly Release, California Employment Development Department

Appendix Figure A-4: Engineering News Record Construction Cost Index (CCI), Building Cost Index (BCI) and Los Angeles Metropolitan Statistical Area Total Annual Wages (1983-2016); Normalized to 1983



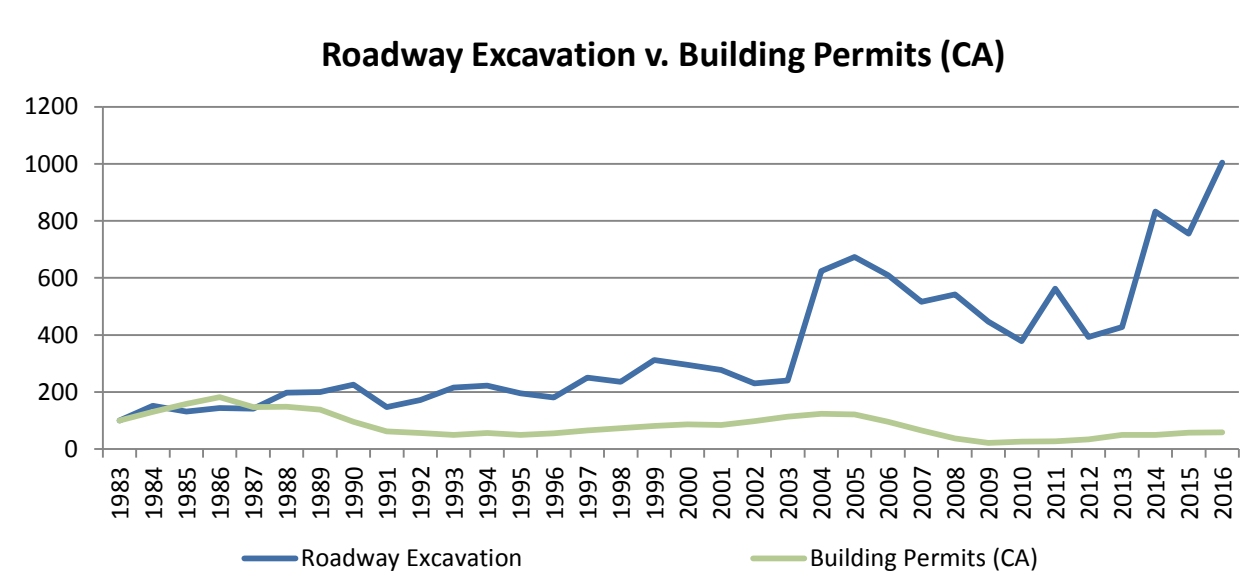
Source: Engineering News Record Monthly Release, California Employment Development Department

Appendix Figure A-5: Engineering News Record Construction Cost Index (CCI), Building Cost Index (BCI) and Los Angeles Metropolitan Statistical Area Per Capita Personal Income (1983-2016); Normalized to 1983



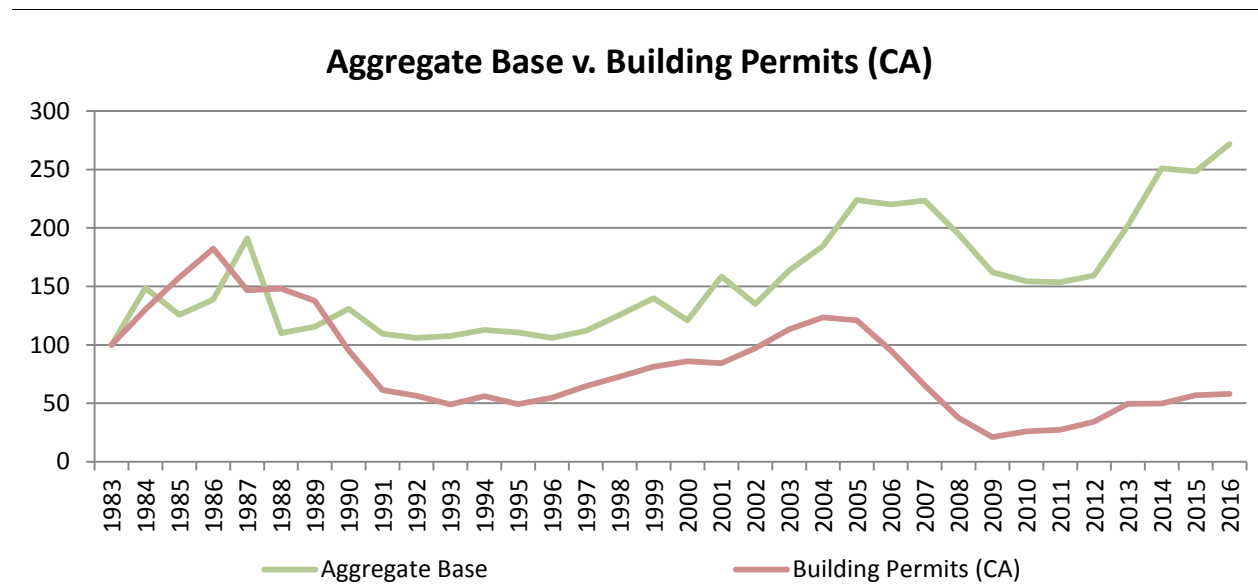
Source: Engineering News Record Monthly Release, U.S. Bureau of Economic Analysis

Appendix Figure A6: Roadway Excavation Costs versus California Building Permits, Normalized to 1983 = 100



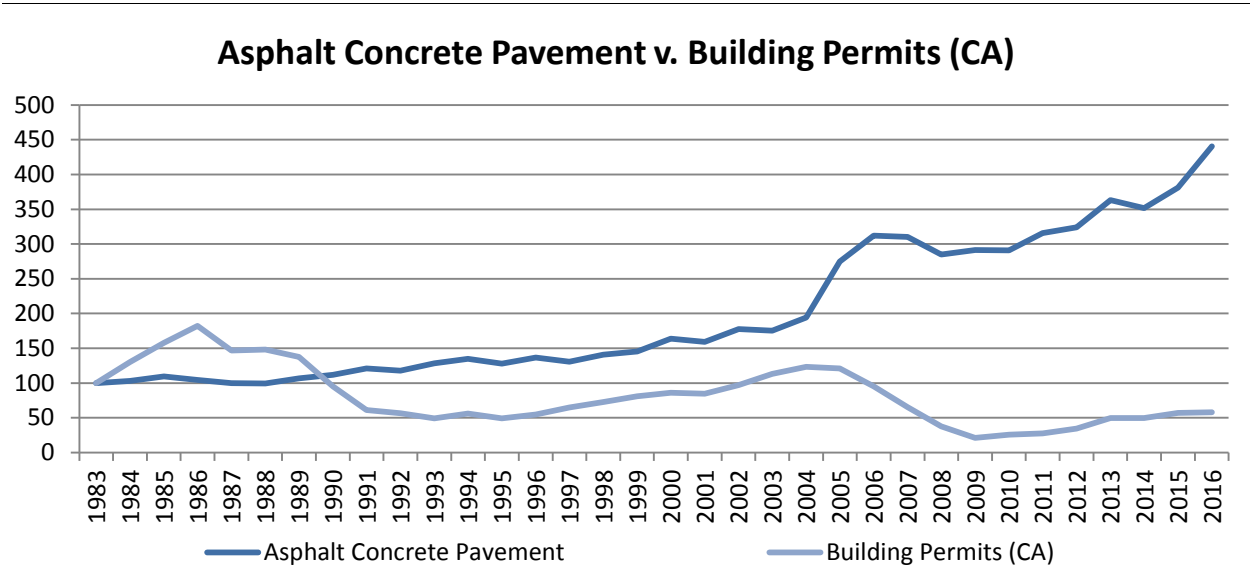
Source: California Department of Transportation, U.S. Census Bureau Building Permit Survey

Appendix Figure A7: Aggregate Base Cost versus California Building Permits, Normalized to 1983 = 100



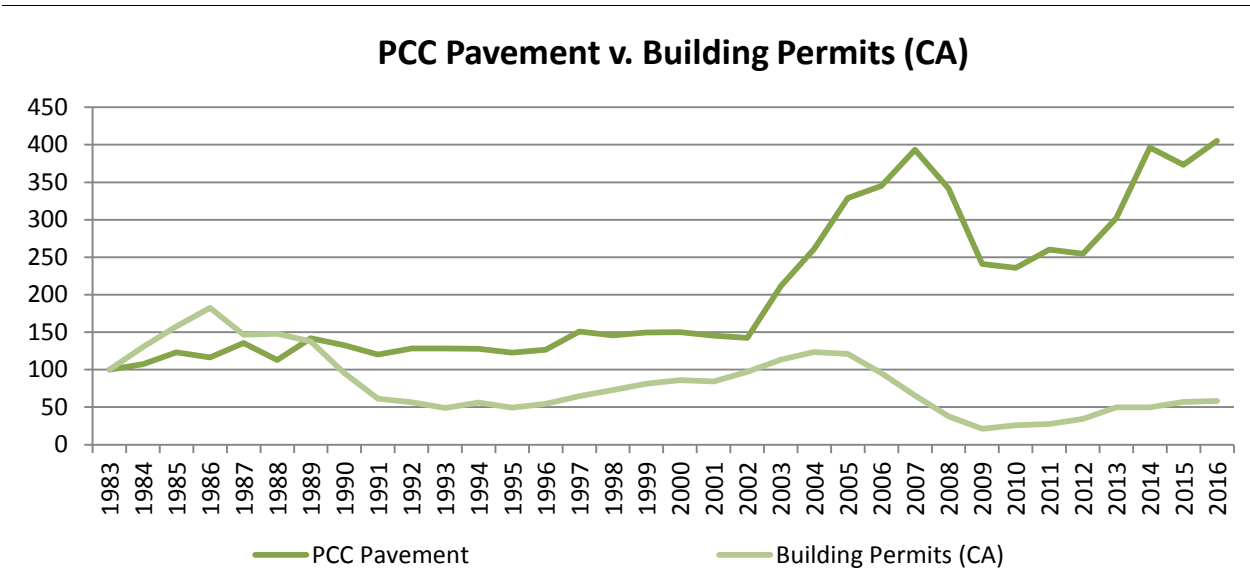
Source: California Department of Transportation, U.S. Census Bureau Building Permit Survey

Appendix Figure A8: Asphalt Concrete Cost versus California Building Permits, Normalized to 1983 = 100



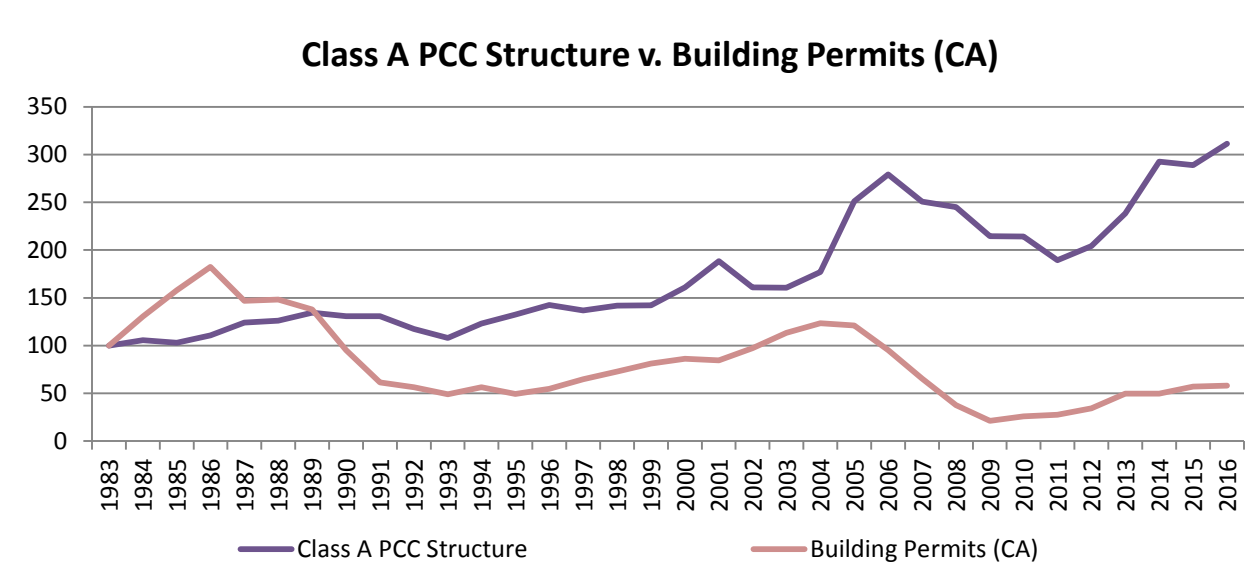
Source: California Department of Transportation, U.S. Census Bureau Building Permit Survey

Appendix Figure A9: PCC Pavement Cost versus California Building Permits, Normalized to 1983 = 100



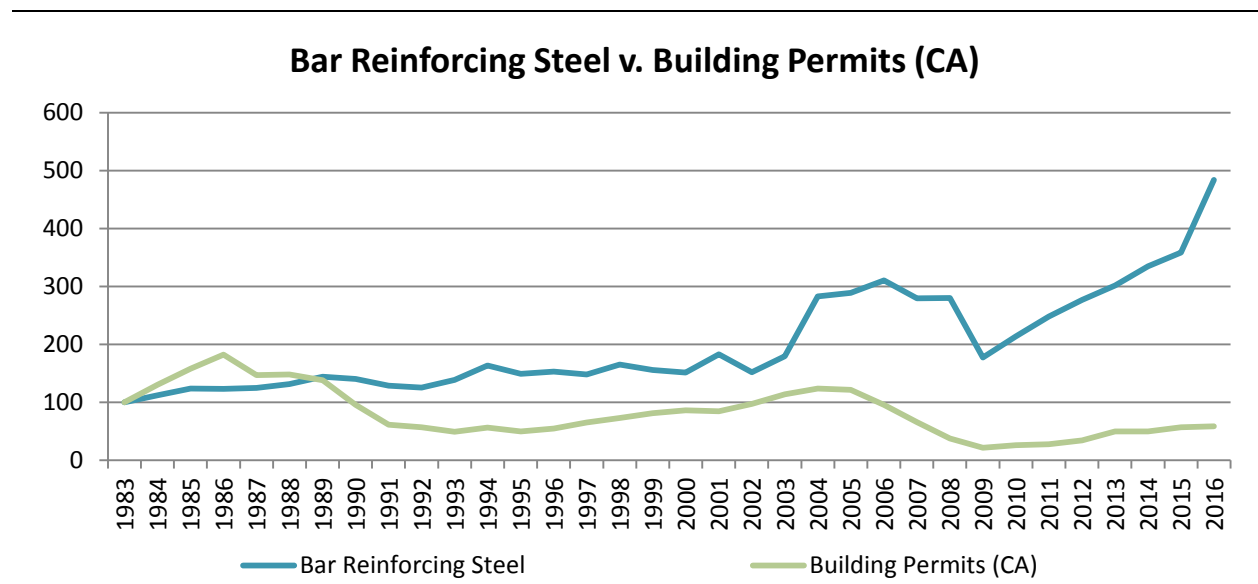
Source: California Department of Transportation, U.S. Census Bureau Building Permit Survey

Appendix Figure A10: Class A PCC Structure Cost versus California Building Permits, Normalized to 1983 = 100



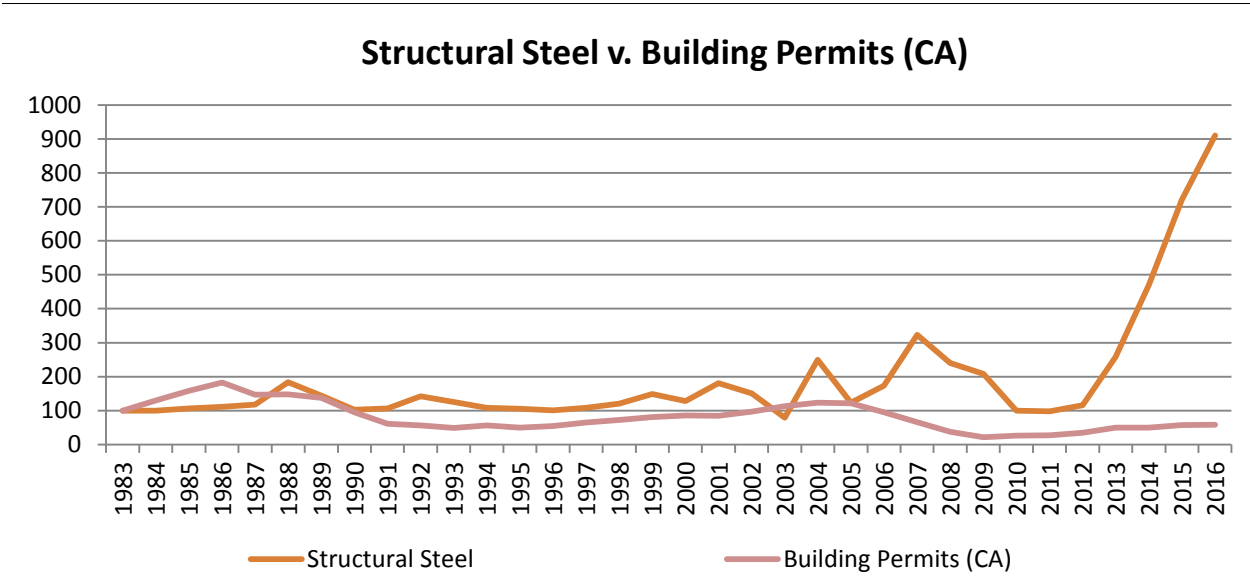
Source: California Department of Transportation, U.S. Census Bureau Building Permit Survey

Appendix Figure A11: Bar Reinforcing Steel Cost versus California Building Permits, Normalized to 1983 = 100



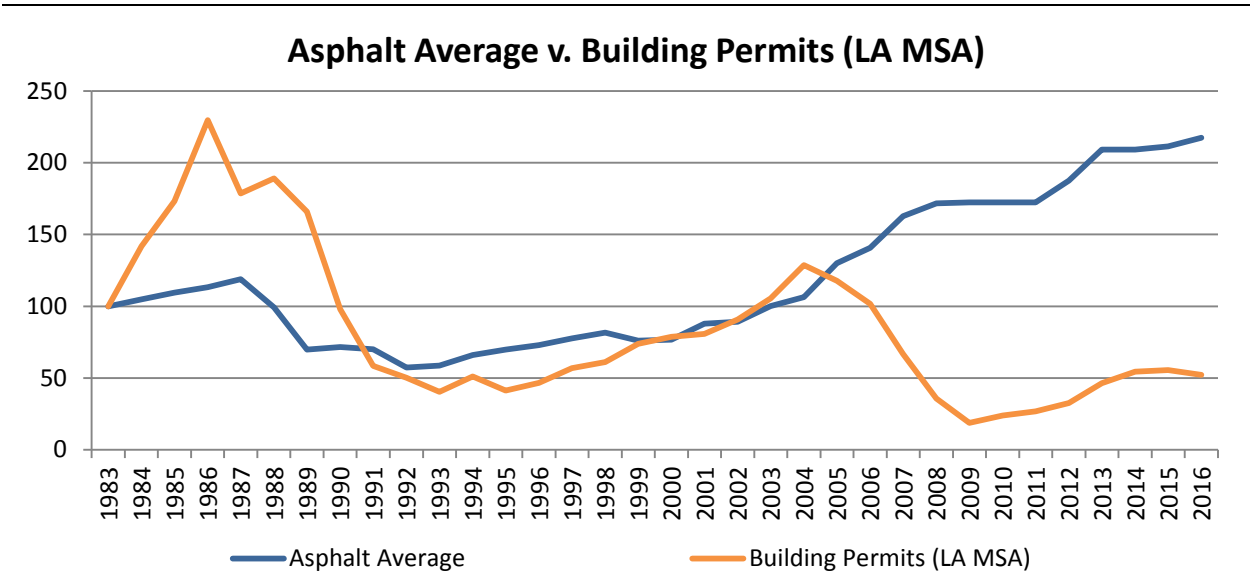
Source: California Department of Transportation, U.S. Census Bureau Building Permit Survey

Appendix Figure A12: Structural Steel Cost versus California Building Permits, Normalized to 1983 = 100



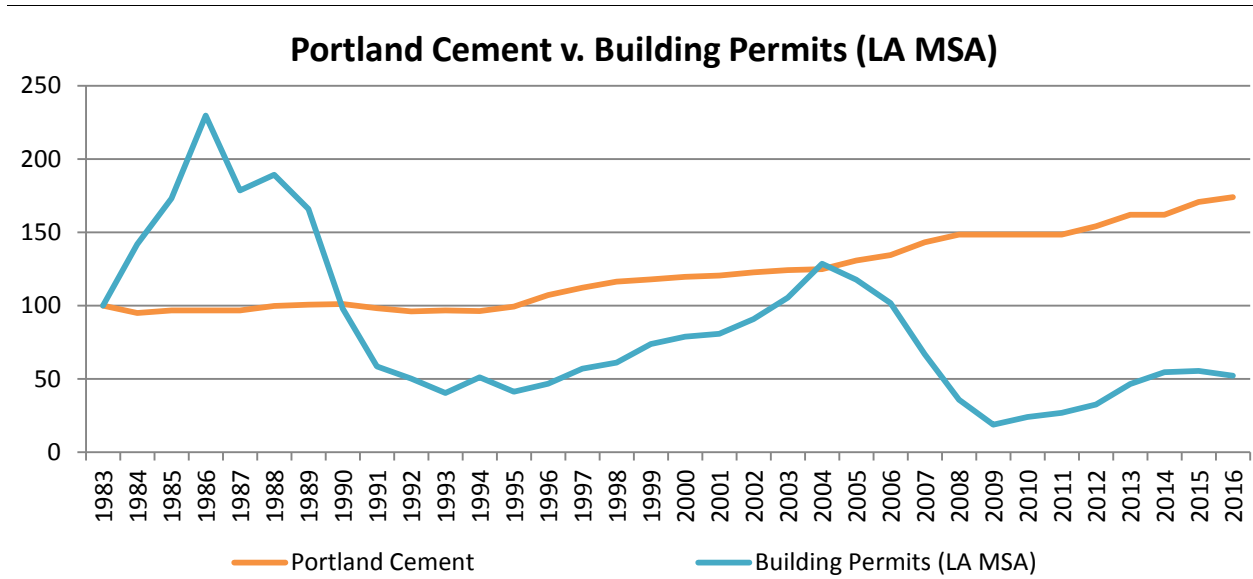
Source: California Department of Transportation, U.S. Census Bureau Building Permit Survey

Appendix Figure A13: Asphalt Cost (average) versus Los Angeles Metropolitan Area Building Permits, Normalized to 1983 = 100



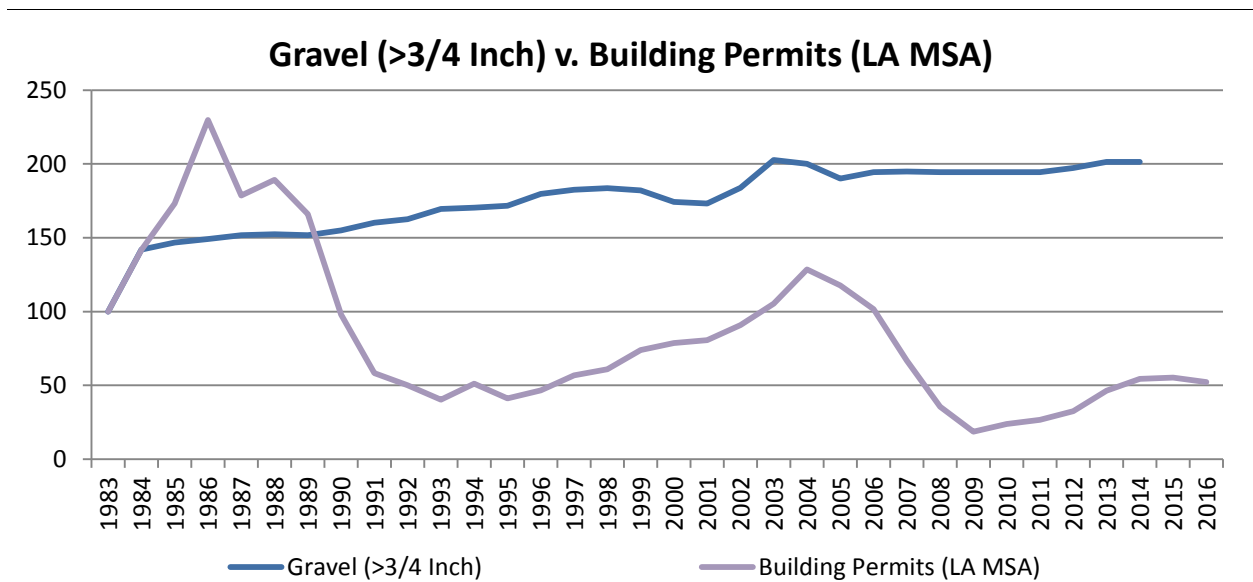
Source: Engineering News Record, U.S. Census Bureau Building Permit Survey

Appendix Figure A14: Portland Cement Cost versus Los Angeles Metropolitan Area Building Permits, Normalized to 1983 = 100



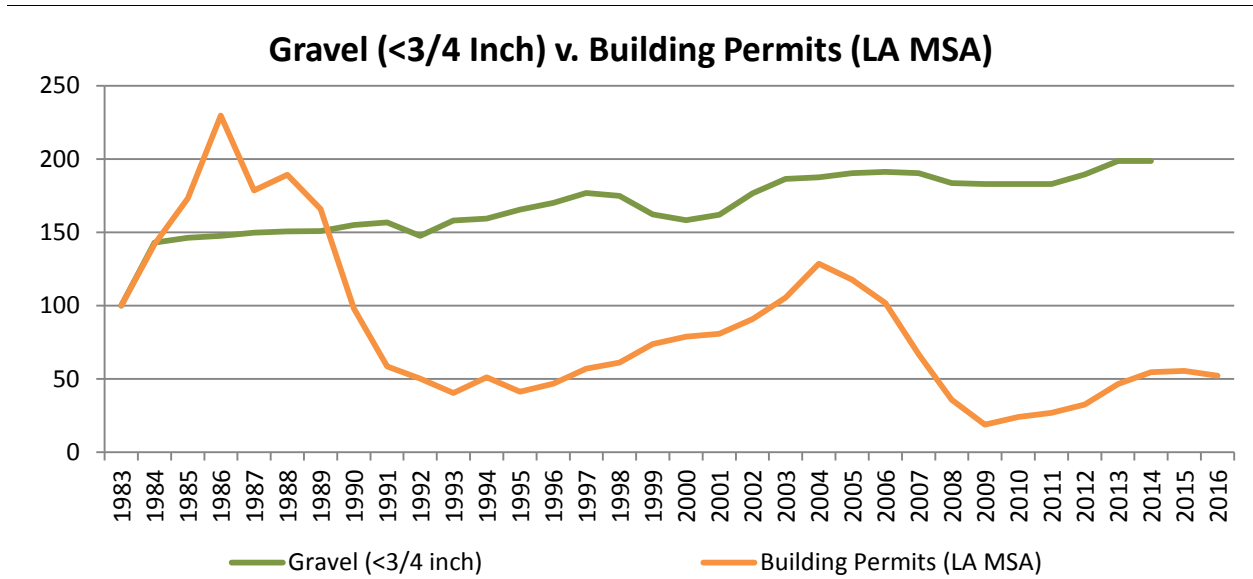
Source: Engineering News Record, U.S. Census Bureau Building Permit Survey

Appendix Figure A15: Gravel (>3/4 inch) Cost versus Los Angeles Metropolitan Area Building Permits, Normalized to 1983 = 100



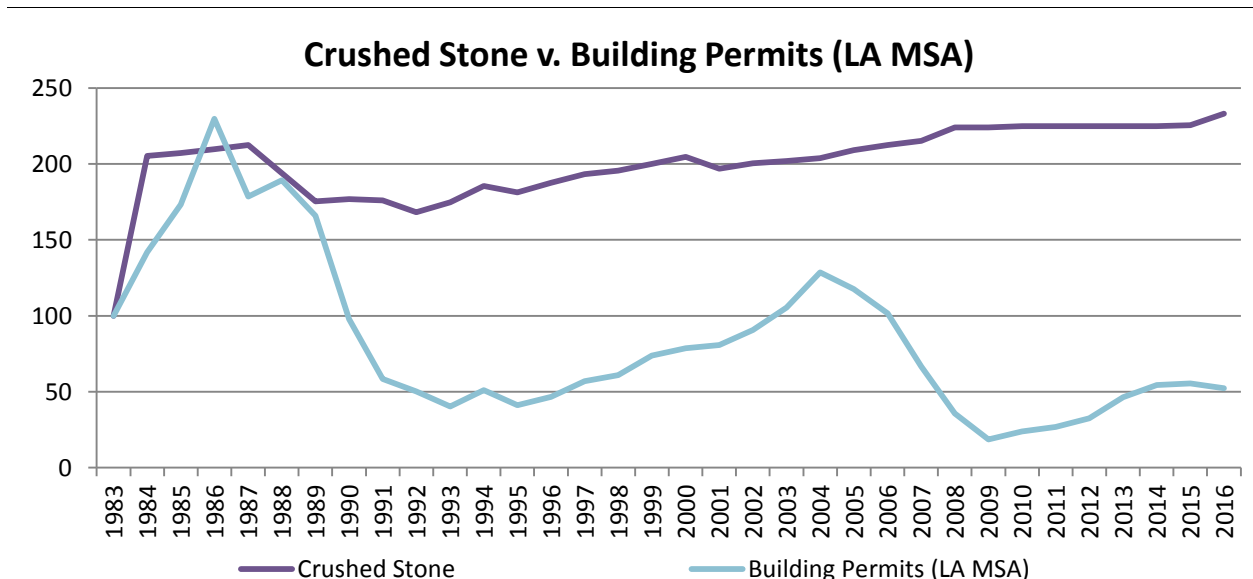
Source: Engineering News Record, U.S. Census Bureau Building Permit Survey

Appendix Figure A16: Gravel (<3/4 inch) Cost versus Los Angeles Metropolitan Area Building Permits, Normalized to 1983 = 100



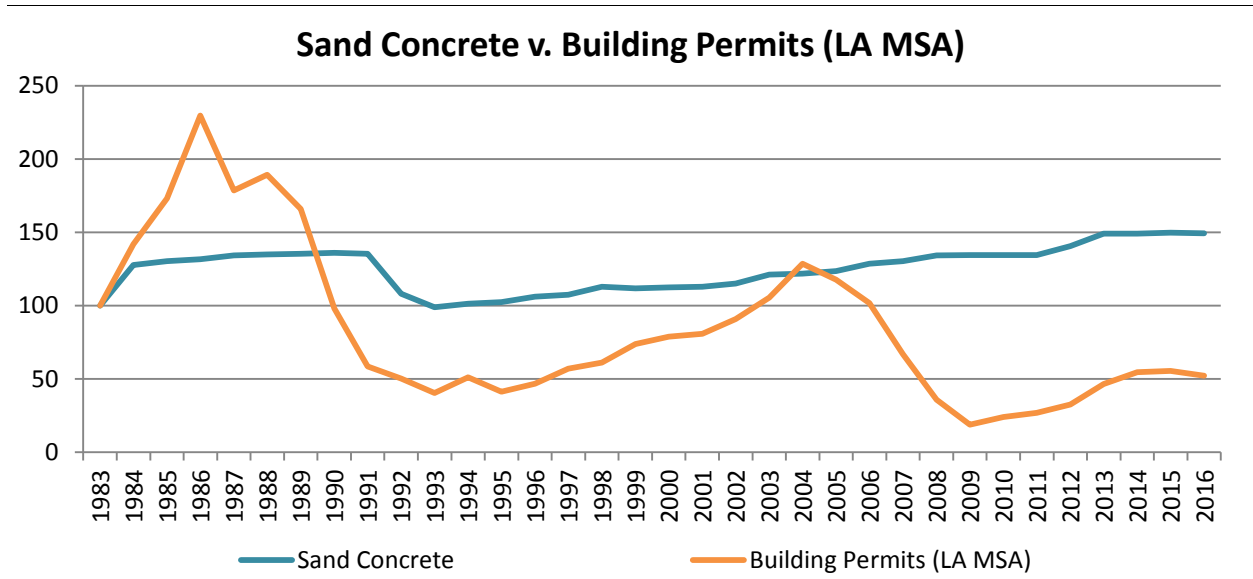
Source: Engineering News Record, U.S. Census Bureau Building Permit Survey

Appendix Figure A17: Crushed Stone Cost versus Los Angeles Metropolitan Area Building Permits, Normalized to 1983 = 100



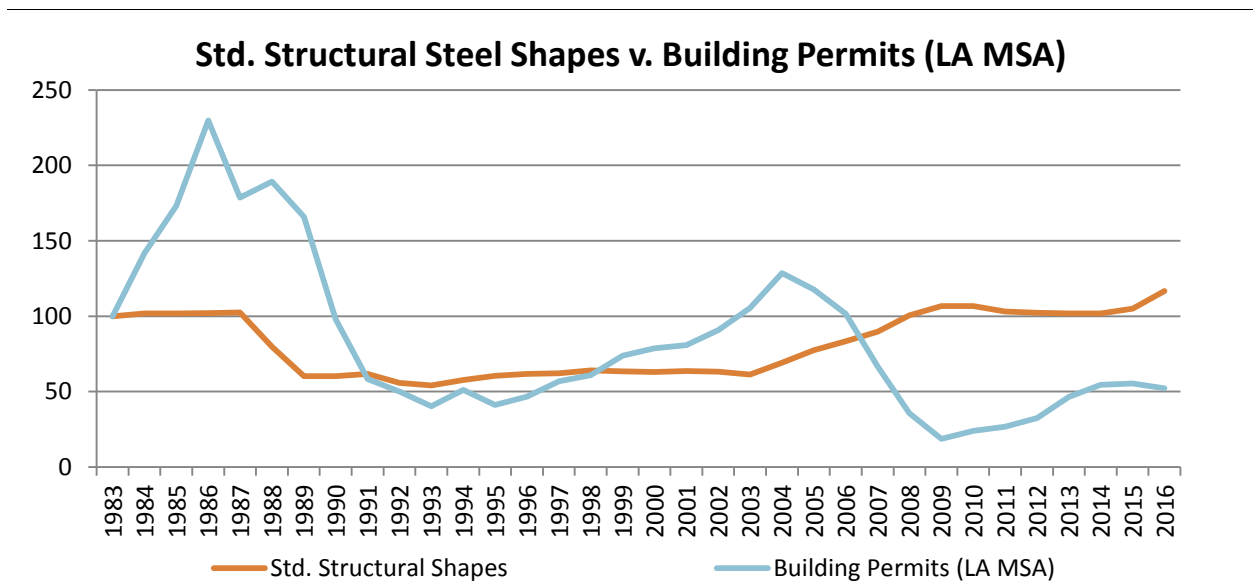
Source: Engineering News Record, U.S. Census Bureau Building Permit Survey

Appendix Figure A18: Sand Concrete Cost versus Los Angeles Metropolitan Area Building Permits, Normalized to 1983 = 100



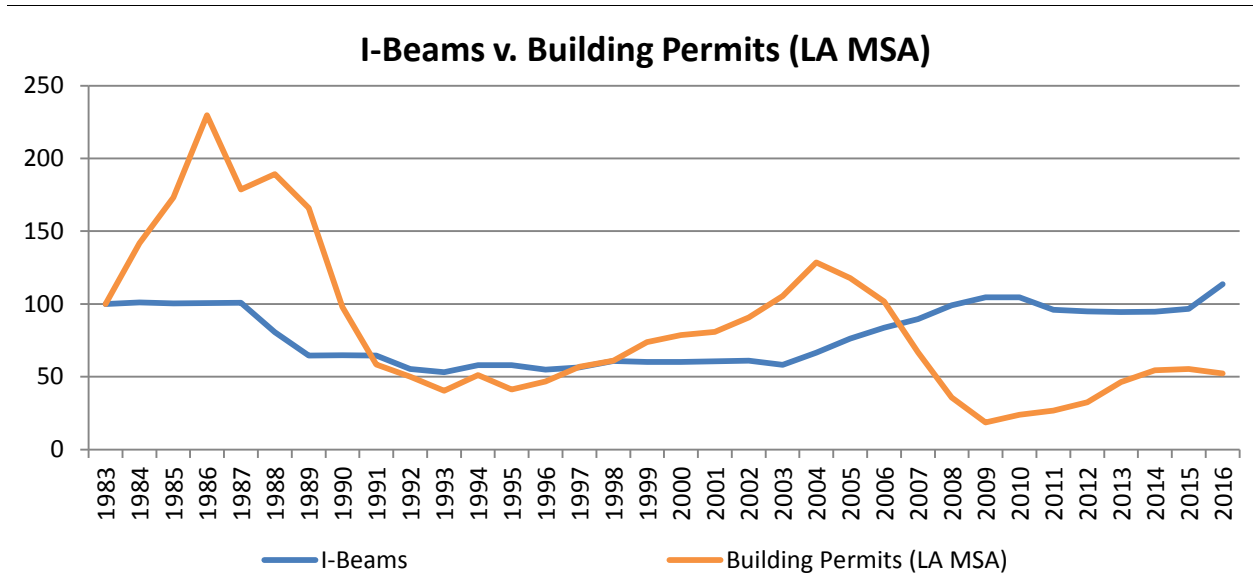
Source: Engineering News Record, U.S. Census Bureau

Appendix Figure A19: Std. Structural Steel Shapes Cost versus Los Angeles Metropolitan Area Building Permits, Normalized to 1983 = 100



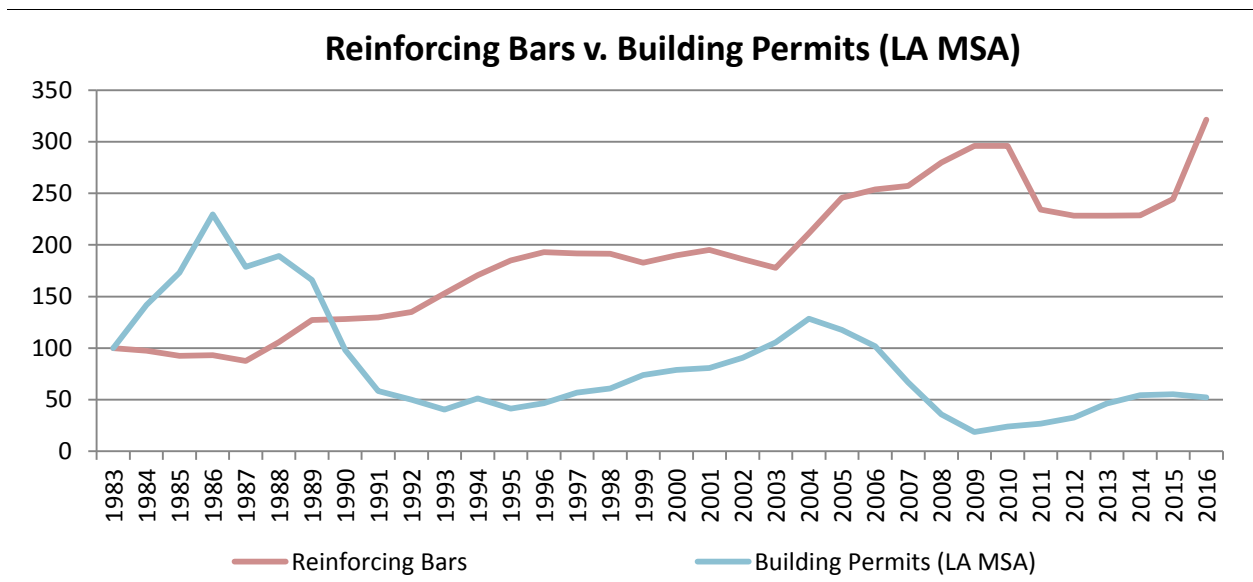
Source: Engineering News Record, U.S. Census Bureau Building Permit Survey

Appendix Figure A20: I-Beam Cost versus Los Angeles Metropolitan Area Building Permits, Normalized to 1983 = 100



Source: Engineering News Record, U.S. Census Bureau Building Permit Survey

Appendix Figure A21: Reinforcing Bars Cost versus Los Angeles Metropolitan Area Building Permits, Normalized to 1983 = 100



Source: Engineering News Record, U.S. Census Bureau Building Permit Survey

Risk Factors, Effect on Public Works Costs, and Some Possible OCTA Mitigations

Risk Factor	Impact on Costs	Likelihood	Comments	Possible OCTA Mitigations
Sustained low unemployment	Increases costs beyond Table 5 model prediction	Likely in the next 2 to 5 years	Wage pressure is still low, suggests that the economy has continued room to expand without necessitating policy efforts (i.e. interest rate increases) that would induce a recession	Accelerate the next 2 to 3 years of the Next 10 Plan Increase the supply of contractors
Increased Building Permitting (and hence residential construction)	Increases costs	Unlikely given long-term political factors, but regulatory change could be sudden	Increasing permitting depends in part on state or local political changes, but Inland Empire construction has been increasing rapidly	Accelerate next 2 to 3 years of the Next 10 Plan Labor force training to increase supply of skilled construction labor
Continued Consolidation in Construction and Architecture/Engineering Industry	Increases costs in near-term, then pressure for costs to remain high	Likely, given recent consolidation trends	The industry has been consolidating. Unclear whether that trend has played out or will continue.	OCTA becomes a preferred client Reduce barriers to new entrants into OCTA bid process Innovate in ease of doing business with OCTA
Interest Rate Increases	Short-term cost increases as financing costs, for OCTA and contractors, increase – long-term downward cost pressure if recession ensues	Highly likely to have moderate interest rate increases in next 2 to 5 years	U.S. is near historically low interest rates; global savings glut will exert downward pressure on interest rates; on net, rate increases likely to be moderate and sustained	Complete financing agreements in the near-term to avoid higher interest rates

Risk Factor	Impact on Costs	Likelihood	Comments	Possible OCTA Mitigations
Neighboring County Transportation Programs Exert Cost Pressure	Increases Costs	Highly Likely; current work programs in neighboring counties meet or exceed level in Orange County	Recent self-help sales tax increases “lock in” sustained demand for public works contractors in Southern California	OCTA becomes a client of choice Simplify the bid process and process of doing business with OCTA Accelerate Next 10 Plan to lock in prices before peak market pressure from neighboring counties
Increasing Construction Wage Pressure	Increases Costs	Likely in foreseeable future, unless residential market reverses course (which would likely coincide with a recession)	Construction wages increases by from 4.39 to 5.3 percent annually, 2014 to 2016, in Orange and neighboring SCAG region counties	Accelerate Next 10 Plan in advance of additional increases in construction wages Support efforts to increase the pool of construction labor
Recession	Decreases Costs	Likely within the next 10 years, but timing highly uncertain	Recession will reduce demand for private sector residential and commercial construction, but public sector demand will remain although sales tax revenues will drop in a recession	Timing uncertainty makes mitigation measures, beyond those listed above, difficult to implement

OCTA – Orange County Transportation Authority

SCAG – Southern California Association of Governments

Next 10: Market Conditions Forecast and Risk Analysis

Orange County Business Council

Objectives

- Forecast and Analyze
 - Public infrastructure market impact from anticipated work in the next 5 to 10 years
 - Likelihood of competitive cost pressures
 - Availability of materials, equipment, labor, and qualified professional services
- Provide OCTA with Information to Manage Market Impacts and Guide Delivery of the Next 10 Plan



Timeline

- 2006: Measure M renewal approved
- 2007: Expedited delivery of Measure M2 begins
- 2008: Official Beginning of Great Recession & Original Market Analysis Report
- 2009: Official End of Great Recession
- 2012: M2020 Plan adopted
- 2016: New forecasting methodology to reflect lower tax revenue; Next 10 Plan approved



Seven Risk Factors

- Sustained low unemployment
- Increases in residential construction
- Consolidation in the public works construction industry
- Increases in interest rates
- Neighboring County transportation construction programs
- Construction wage pressure
- Future recession



Near Term Cost Risks

- Neighboring County Transportation Construction Programs

Southern California Regional Construction Costs 2016-2025 Period Freeways and Transit (\$'s shown in billions)	
Los Angeles	\$47.7
San Bernardino	\$11.9
Riverside	\$10.0
Orange County Measure M (Next 10 Projects) Total	\$ 4.8

- Construction Wage Pressures

County	Construction Wage, % annual growth	
	2012-2014	2014-2016
Los Angeles	1.97%	4.53%
San Bernardino	0.49%	4.61%
Riverside	2.36%	5.30%
Orange	1.34%	4.39%

- Sustained Low Unemployment
- Increases in Residential Construction

Looking Forward

Cost Mitigation Recommendations

- Monitor early warning indicators
 - Building permits
 - Construction employment and wages
 - Executive opinion of local economy
 - Construction commodity costs
- Consider partnering on apprenticeship programs
- Continue to be a preferred client for public works construction companies
- Look for acceleration opportunities for Next 10 Delivery Plan



Questions