Measure M
Taxpayers Oversight Committee
at the Orange County Transportation Authority
600 S. Main Street, Orange CA
June 15, 2010
6:00 p.m.

AGENDA

1. **Welcome**
2. **Pledge of Allegiance**
3. **Approval of Minutes/Attendance Report for April 13, 2010**
4. **Chairman's Report**
5. **Co-Chair Election**
6. **Subcommittee Selection**
7. **Action Items**
   A. Quarterly M1 Revenue and Expenditure Report – March 2010
   Receive and File
8. **Presentation Items**
   A. Sales Tax Forecast Update
   Presentation – Ken Phipps, Executive Director, Finance & Administration

   B. Freeway Program Update
   Presentation – Tom Bogard, Director, Highway Project Delivery

   C. M2 Water Quality Program – Funding Approach
   Presentation – Charlie Larwood, Manager, Strategic Planning

   D. M2 Pavement Management Plan
   Presentation – Kia Mortazavi, Executive Director, Development
9. **Growth Management Subcommittee Report**
10. **Audit Subcommittee Report**
11. **Committee Member Reports**
12. **OCTA Staff Update**
13. **Public Comments***
14. **Adjournment to next meeting – August 10, 2010**

*Public Comments: At this time, members of the public may address the Taxpayers Oversight Committee (TOC) regarding any items within the subject matter jurisdiction of the TOC, provided that no action may be taken on off-agenda items unless authorized by law. Comments shall be limited to five (5) minutes per person and 20 minutes for all comments, unless different time limits are set by the Chairman, subject to the approval of the TOC.

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 business days prior to this meeting to enable OCTA to make reasonable arrangements to assure accessibility to this meeting.

Measure M
Taxpayers Oversight Committee Meeting

April 13, 2010
Meeting Minutes

Committee Members Present:
David Sundstrom, County Auditor-Controller, Chairman
Anh-Tuan Le, Second District Representative
C. James Hillquist, Third District Representative
Edgar Wylie, Third District Representative
Rose Coffin, Fourth District Representative
Gregory Pate, Fourth District Representative
James Kelly, Fifth District Representative

Committee Members Absent:
Linda Rogers, First District Representative
Vivian Kirkpatrick-Pilger, First District Representative
Howard Mirowitz, Second District Representative
Hamid Bahadori, Fifth District Representative

Orange County Transportation Authority Staff Present:
Janice Kadlec, Public Reporter
Kia Mortazavi, Executive Director of Development
Dan Phu, M2 Environmental Mitigation Program Manager
Tresa Oliveri, Senior Community Relations Specialist
Alice Rogan, Community Relations Officer
Joe Toolson, Grade Separation Projects Program Manager

Members of the Public:
No members of the public attended.

1. **Welcome**
   Chairman David Sundstrom began the meeting at 6:10 p.m. and welcomed everyone.

2. **Pledge of Allegiance**
   Chairman David Sundstrom led everyone in the pledge of allegiance.

3. **Approval of Minutes/Attendance Report for February 9, 2010**
   Chairman David Sundstrom asked if there were any additions or corrections to the February 9, 2010 minutes and attendance report.

Anh-Tuan Le noted in the list of Members of the Public on page one, Charlotte Fox should be identified as a member of the *Grand Jurors Association* and there was another public member in attendance: *Sr. Stephen Chan*

Ahn Tuan said there was a small "typo" on page 12, paragraph 6, forth sentence: *Kia Mortazavi said there was one other bid and City Council made changes to the staff recommendation and came up with a ~~highbred~~ **hybrid** recommendation.*

A motion was made by Rose Coffin and seconded by James Kelly to approve the February 9, 2010 minutes and attendance report as corrected. The motion passed unanimously.

4. Chairman's Report
Chairman David Sundstrom had no report.

5. Presentation Items

A. M2 Environmental Mitigation Program Update
Dan Phu said the OCTA's Mitigation and Resource Protection Program (Mitigation Program) provides for an allocation of at least five percent of the total M2 freeway budget for comprehensive environmental mitigation for the impacts from freeway improvements. He provided a "fact sheet" outlining the program and gave an update on the progress achieved to date.

Rose Coffin, the delegate from the TOC to the Environmental Oversight Committee (EOC), reported the environmental process of the EOC is very intricate and time consuming. The EOC has grouped properties based on biological and non-biological factors and are about to start the appraisal process on the top rated properties.

Dan Phu said the program has approximately $27 million for the fiscal year (FY) 2010/2011 and another $25 million for FY 2011/2012 for acquisition and restoration. This program was approved by the OCTA Board of Directors (Board) for the Early Action Plan in August 2007.

B. Grade Separation Projects Schedule and Outreach Update
Joe Toolson and Tresa Oliveri presented the Grade Separation Projects Schedule and Outreach Update. Joe Toolson provided a video and power point overview of the projects and goals. Tresa Oliveri gave an update of the Outreach program.

James Hillquist said he had a request from a member of the public to find out when the public meetings would be held on the grade crossings. Tresa said they have not held a public meeting yet, they have only been meeting with property owners who might be affected. James Hillquist said this person is a business owner. Joe Toolson said there will be significant changes in the area and they are working very closely with the property owners who will be impacted by construction. They

are meeting with the business owners and focusing efforts to keep access open to their businesses during construction.

Ahn Tuan Le asked about the following:

- Possible risk in planning and design because of the tight schedules.
- The *Del Serro* lawsuit.
- Has the Burlington Northern Santa Fe (BNSF) Railroad operations completely bought into the projects
- Noise and vibration issues.

Joe Toolson said regarding the lawsuit from Del Serro, OCTA has filed a Demur saying under CEQA section 18 the grade separations are exempt from environmental regulations and recently a judge has upheld it - which means the lawsuit is thrown out. OCTA does not want to damage the community and has worked very hard to come up with an access concept. He believes Del Serro has bought into the plans and by continuing to work with the community, OCTA has eliminated the risk. Joe Toolson said at one time there was another partner in the lawsuit at Orangethorpe; he wants to be bought out and the reality is in the context of the project he needs to be bought out. He feared he would be driven out of business and the reality is OCTA cannot build the project without taking his property. The risk in this situation has been completely deleted in the last week.

Joe Toolson said as to the noise and vibration issue - the environmental documents do acknowledge this. At the same time they do include vibration specs in the contracts. There are noise ordinances they have to adhere to. Anh Tuan Le inquired about noise levels as a permanent condition not just during construction. The current base line is increased traffic and increased BSNF rail. Joe Toolson said they have a cleared environmental document, an exemption from CEQA, and the agency is following city ordinances and doing all it can to help and work with the community. This is the reason for an outreach group. There are other big concerns for cities, but the biggest concern is not doing the project because grade separations are a safety issue and need to be done.

Joe Toolson said he works with the BNSF on a weekly basis. He said of all the railroads he has dealt with, BNSF is the best. They are an operational company, they want to keep their goods moving, but they understand where they are going to be in five to ten years and they want the grade separation project. The other issue they have is a "quiet zone" issue – they want to separate traffic from freight, they want to get their speed up which will increase once the grade separation is complete. BNSF is an advocate of the project.

Anh-Tuan Le asked where the issue of a third track fits in. Joe Toolson said the OCTA project allows for the width of right of way to expand for an additional track,

but will not build the additional track. BNSF intends to put in a third track very shortly, but they have to clear it environmentally.

Chair David Sundstrom said it is his understanding the length of trains may increase to one to two miles. The time delay will be significant. Joe Toolson said he was correct, when talking to the community they are not against the project they just want to get through the build period.

Anh-Tuan Le said there was no doubt about the necessity; there is just a big scope of risk built into the project.

Joe Toolson said the project will be doing a great deal of night work and unfortunately there are many residential neighborhoods; OCTA plans to work closely with these neighborhoods. Sound issues and ordinances need to be addressed.

James Kelly said the railroad seems to have a vested interest in the project. Did they put up any money toward the project? Joe Toolson said yes, if there is any federal money in the project the railroad is required by law to provide five percent of the theoretical cost.

James Kelly asked if undercrossings or overcrossings more expensive to build. Joe Toolson said the undercrossings cost more because they take longer to build.

C. M1 and M2 Combined Transportation Funding Programs (CTFP) Update

Kia Mortazavi gave a status report on the delivery of the Streets and Roads program for M1 and M2 programs.

Anh-Tuan Le said at a previous meeting, a committee member said the tightened standards may put a burden on the cities which have undergone cutbacks because of the economy. Anh-Tuan Le said Kia Mortazavi's reply was these tightened standards were put in to make the taxpayer more comfortable, which is a fair statement. His comment was he hoped OCTA holds them accountable. Kia Mortazavi said he was correct; it is OCTA's responsibility to oversee administration of a program to make sure the funds are allocated appropriately and the projects delivered on time. Kia said OCTA has been flexible in the past and granted extensions, but with the approaching end of the M1 program, the expectation is these funds should be put to use to make improvements to the Streets and Roads system.

Kia Mortazavi highlighted the changes between the M1 and M2 CTFP. The biggest change is M1 had a five year capital improvement program (CIP) and a two year call for projects – M2 has a three year CIP and a call for projects every year. Also under M2 participants can ask for a phase of a project (design, right of way, etc.) as opposed to asking for funds for the entire project. They can still ask for funds for the entire project if they choose but have the flexibility of only asking for

funds for a phase of the project if they desire. These changes hope to produce more accuracy and more deliverable projects.

Also, a second change took place in the amount of upfront money provided to local agencies. Under M1, once a contract is awarded, the participant receives 90% of the contract value or grant money matching funds. M2 will change the amount of upfront money awarded to 75%. The M2 CTFP local share can be reduced to 25% minimum local match. The purpose of these changes is to reduce the amount of upfront money given to the local agencies and allow for more projects.

D. I-405 Project Update

Kia Mortazavi gave an update to the I-405 Project. He said the OCTA Board still has questions about the proposed alternatives, but OCTA's job is to look at options. There is a commitment to deliver improvements in the I-405 corridor, but there are significant issues in terms of cost. OCTA has explored different methods of delivering the project.

Chair David Sundstrom asked if the four alternative methods proposed all used the same number of cars per hour in the projections. Kia said the same demand is used in all four alternatives.

Chair David Sundstrom asked would the Express lanes be public owned. Kia said it has not been decided yet. The only thing the Board asked was to pursue the options through the environmental process. There are opportunities to pursue a public/private partnership, but OCTA is very sensitive to the SR-91 experience.

James Kelly asked if the project had been looked at through a sustainability perspective. Kia said they will have this type of information as the project progresses. There may be a need to have a "Green" alternative because of AB32 and SB375.

Anh-Tuan Le asked if the scoping meetings were the contact with the design team. Kia said the scoping meetings were held as part of the environmental process. Anh-Tuan Le said he would like to get noticed when some of these meetings occur. He lives in the I-405 corridor; this project will affect local traffic and he would like to get involved in some of the meetings. Other things can be looked at to reduce demand such as TDM and Rideshare. Alice Rogan said he will receive notice of the meetings. Kia said to keep in mind OCTA has taken a significant hit in terms of ability to provide transit. The only good news is it seems like we have seen the worst of it and are working to build back transit services but in a smarter manner in terms of bikeways, rideshare/vanpools, express bus service, Go Local, etcetera.

Chair David Sundstrom asked if growth had been considered in the modeling for the project. Kia said the city general plans are looked at, but are constrained by the Department of Finance projections and are reconciled back.

Chair David Sundstrom asked if both northbound and southbound traffic was equal because of sprawl. Kia said this is a good question but he will have to get back to him. It varies by the reach of the freeway. Chair Sundstrom said he was thinking of bi-directional lane control. Kia said in order to make this work it would need a 60/40 split

Chair David Sundstrom asked if electronic guideways have been considered. Kia said there was a trend to put intelligence in the roadways, but now the focus is to put it in the cars. OCTA is looking at operational improvements such as continuous access carpool lanes and ramp meters.

Gregory Pate said he very glad to see the continuous access carpool lanes because he has seen some very bad accidents involving people exiting and entering the lanes improperly. Kia said OCTA has plans to restripe the remaining portion of the SR-55, the I-5, SR-57 and the Measure M 2 projects.

6. **Growth Management Subcommittee Report**
   The Growth Management Subcommittee had nothing to report.

7. **Audit Subcommittee Report**
   Chairman David Sundstrom reported the Audit Subcommittee focused on the M2 Triennial Assessment. OCBC presented a draft plan outline of the hours they planned on spending in nine key areas. Chair Sundstrom said he was very happy with the presentation; it gives the Subcommittee the opportunity to get a forward look at how M2 is organized, where it is going, and what the potential logistical strengths and weaknesses are.

   Chair Sundstrom said the Subcommittee selected cities for M2 turnback audits. OCBC is going to be looking at sales tax and sales tax projections and try to get some better insight into how the Board of Equalization arrive at their numbers. Chair Sundstrom also reported the recent Sales Tax figures indicate the recession looks to be bottoming out but it is unlikely the original sales tax revenue projection for M2 will ever be reached.

8. **Committee Member Reports**
   Anh-Tuan Le summed up some points:

   - Someone will be getting him the meeting schedules for the I-405. Alice Rogan said he will get the schedule.

   - The Code of Conduct will be on the next agenda. Alice Rogan said Will Kempton will include this in his planned update report at the next TOC meeting.

- The minutes from the Annual Public Hearing talked about the role of the TOC being able to authorize programs outside of the M1 program. The only one he could think of was the SR-22 project. Is this correct or were there other projects? Chairman David Sundstrom said the TOC is part of the approval process to incorporate a new project into the program. There have been no other projects other than the SR-22.

- The previous meeting minutes stated the TOC is able to access resources to do oversight through contracting. Has this been done before? Chairman Sundstrom said this could be done but it has never been asked for.

- There was an item brought up at the last meeting that the Grand Jurors recommended a stipend be given to the TOC. The goal was to expand the pool of candidates for the TOC. Anh-Tuan Le said this seemed like a very good recommendation from the Grand Jurors. Alice Rogan said the Grand Jurors retracted their recommendation. Chair Sundstrom said they did not believe the timing was appropriate taking in the current state of the economy. David Sundstrom said he thought it was only fair the other members receive a stipend and it was not an outrageous request. Rose Coffin said for some of the members it is a record keeping problem; OCTA feeds the committee and pays for parking – this is enough.

9. OCTA Staff Update

Alice Rogan said recruitment for new TOC members started April 3. Linda Rogers, First District Representative, will reapply for her seat on the TOC. Rose Coffin, Fourth District Representative, has not decided. C. James Hillquist, Third District Representative will reapply.

Alice Rogan said the Grand Jurors have gone to the individual cities to advertise the openings on the TOC and the Board members also bring the news to their constituents.

Edgar Wylie said the next TOC meeting occurs on an election day (June 8) and asked if the date could be changed. Alice Rogan said she will poll the committee members and see if the date could be changed.

Alice Rogan distributed the Measure M 2009 Progress Report to the members.

10. Public Comments

No members of the Public chose to speak.

11. Adjournment

The meeting adjourned at 8:15 p.m. The next meeting of the Taxpayers Oversight Committee will be held in June, 2010 the exact date is pending.

Taxpayers Oversight Committee
Fiscal Year 2009-2010
Attendance Record

X = Present E = Excused Absence * = Absence Pending Approval U = Unexcused Absence -- = Resigned

Meeting Date	14-Jul	11-Aug	8-Sep	13-Oct	10-Nov	8-Dec	12-Jan	9-Feb	9-Mar	13-Apr	11-May	15-Jun
Hamid Bahadori		X		X		X		X		*		
Rose Coffin		E		E		E		X		X		
C. James Hillquist		X		X		E		X		X		
James Kelly		X		X		X		X		X		
Vivian Kirkpatrick-Pilger		X		X		X		X		*		
Anh-Tuan Le		X		X		X		X		X		
Howard Mirowitz		X		E		X		X		*		
Gregory Pate		X		X		X		X		X		
Linda Rogers		NA		X		X		X		*		
David Sundstrom		X		X		X		X		X		
Edgar Wylie		X		E		X		X		X		

Absences Pending Approval

Meeting Date	Name	Reason
April 13, 2010	Hamid Bahadori	Business trip
April 13, 2010	Vivian Kirkpatrick- Pilger	Unable to attend
April 13, 2010	Howard Mirowitz	Business trip
April 13, 2010	Linda Rogers	Out of town

Action Items

Measure M
Schedule of Revenues, Expenditures and Changes in Fund Balance
as of March 31, 2010

($ in thousands)	Quarter Ended Mar 31, 2010	Year to Date Mar 31, 2010 (A)	Period from Inception to Mar 31, 2010 (B)
Revenues:			
Sales taxes	$ 55,801	$ 155,054	$ 3,734,244
Other agencies share of Measure M costs			
Project related	452	8,208	391,390
Non-project related	-	-	613
Interest:			
Operating:			
Project related	11	27	1,041
Non-project related	1,929	8,619	252,669
Bond proceeds	-	-	136,067
Debt service	781	1,257	82,103
Commercial paper	-	-	6,072
Orange County bankruptcy recovery	-	-	42,268
Capital grants	1,487	1,955	160,110
Right-of-way leases	139	298	5,010
Proceeds on sale of assets held for resale	537	1,610	23,501
Miscellaneous:			
Project related	-	-	26
Non-project related	-	-	775
Total revenues	61,137	177,028	4,835,889
Expenditures:			
Supplies and services:			
State Board of Equalization (SBOE) fees	705	2,115	53,815
Professional services:			
Project related	3,384	6,799	184,353
Non-project related	650	1,435	30,749
Administration costs:			
Project related	410	1,263	19,010
Non-project related	1,224	3,640	80,704
Orange County bankruptcy loss	-	-	78,618
Other:			
Project related	26	70	1,303
Non-project related	83	171	15,684
Payments to local agencies:			
Turnback	11,390	21,370	552,126
Other	21,782	74,291	638,313
Capital outlay	27,891	30,792	1,995,565
Debt service:			
Principal payments on long-term debt	78,405	78,405	921,160
Interest on long-term debt and commercial paper	4,509	9,018	556,922
Total expenditures	150,459	229,369	5,128,322
Excess (deficiency) of revenues over (under) expenditures	(89,322)	(52,341)	(292,433)
Other financing sources (uses):			
Transfers out:			
Project related	-	(1,990)	(254,664)
Non-project related	-	-	(5,116)
Transfers in project related	-	-	1,829
Bond proceeds	-	-	1,169,999
Advance refunding escrow	-	-	(931)
Payment to refunded bond escrow agent	-	-	(152,930)
Total other financing sources (uses)	-	(1,990)	758,187
Excess (deficiency) of revenues over (under) expenditures and other sources (uses)	$ (89,322)	$ (54,331)	$ 465,754

See accompanying notes to Measure M Schedules

Measure M
Schedule of Calculations of Net Tax Revenues and Net Bond Revenues (Debt Service)
as of March 31, 2010

($ in thousands)	Quarter Ended Mar 31, 2010 (actual)	Year Ended Mar 31, 2010 (actual)	Period from Inception through Mar 31, 2010 (actual)	Period from April 1, 2010 through March 31, 2011 (forecast)	Total
		(C.1)	*(D.1)*	*(E.1)*	*(F.1)*
Tax revenues:					
Sales taxes	$ 55,801	$ 155,054	$ 3,734,244	$ 211,389	$ 3,945,633
Other agencies share of Measure M costs	-	-	613	-	613
Operating interest	1,929	8,619	252,669	8,649	261,318
Orange County bankruptcy recovery	-	-	20,683	-	20,683
Miscellaneous, non-project related	-	-	775	-	775
Total tax revenues	57,730	163,673	4,008,984	220,039	4,229,023
Administrative expenditures:					
SBOE fees	705	2,115	53,815	1,966	55,781
Professional services, non-project related	650	1,434	21,888	1,961	23,849
Administration costs, non-project related	1,224	3,640	80,704	6,503	87,207
Operating transfer out, non-project related	-	-	5,116	-	5,116
Orange County bankruptcy loss	-	-	29,792	-	29,792
Other, non-project related	83	171	6,585	1,533	8,118
	2,662	7,360	197,900	11,962	209,862
Net tax revenues	$ 55,068	$ 156,313	$ 3,811,084	$ 208,077	$ 4,019,161
		(C.2)	*(D.2)*	*(E.2)*	*(F.2)*
Bond revenues:					
Proceeds from issuance of bonds	$ -	$ -	$ 1,169,999	$ -	$ 1,169,999
Interest revenue from bond proceeds	-	-	136,067	-	136,067
Interest revenue from debt service funds	781	1,257	82,103	4,491	86,594
Interest revenue from commercial paper	-	-	6,072	-	6,072
Orange County bankruptcy recovery	-	-	21,585	-	21,585
Total bond revenues	781	1,257	1,415,826	4,491	1,420,317
Financing expenditures and uses:					
Professional services, non-project related	-	1	8,861	-	8,861
Payment to refunded bond escrow	-	-	153,861	-	153,861
Bond debt principal	78,405	78,405	921,160	82,795	1,003,955
Bond debt interest expense	4,509	9,018	556,922	5,396	562,318
Orange County bankruptcy loss	-	-	48,826	-	48,826
Other, non-project related	-	-	9,099	-	9,099
Total financing expenditures and uses	82,914	87,424	1,698,729	88,191	1,786,920
Net bond revenues (debt service)	$ (82,133)	$ (86,167)	$ (282,903)	$ (83,700)	$ (366,603)

See accompanying notes to Measure M Schedules

Measure M
Schedule of Revenues and Expenditures Summary
as of March 31, 2010

Project Description	Net Tax Revenues Program to date Actual	Total Net Tax Revenues	Project Budget	Estimate at Completion	Variance Total Net Tax Revenues to Est at Completion	Variance Project Budget to Est at Completion	Expenditures through Mar 31, 2010	Reimbursements through Mar 31, 2010	Net Project Cost	Percent of Budget Expended
(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)	(Q)
($ in thousands)										
Freeways (43%)										
I-5 between I-405 (San Diego Fwy) and I-605 (San Gabriel Fwy)	$ 918,946	$ 969,119	$ 810,010	$ 800,650	$ 168,469	$ 9,360	$ 835,971	$ 84,427	$ 751,544	92.8%
I-5 between I-5/I-405 Interchange and San Clemente	64,314	67,825	57,836	59,936	7,889	(2,100)	70,294	10,358	59,936	103.6%
I-5/I-405 Interchange	81,629	86,086	72,802	73,075	13,011	(273)	98,157	25,082	73,075	100.4%
S.R. 55 (Costa Mesa Fwy) between I-5 and S.R. 91 (Riverside Fwy)	54,419	57,391	44,511	50,225	7,166	(5,714)	55,366	6,172	49,194	110.5%
S.R. 57 (Orange Fwy) between I-5 and Lambert Road	27,210	28,695	24,128	22,759	5,936	1,369	25,617	2,859	22,758	94.3%
S.R. 91 (Riverside Fwy) between Riverside Co. line & Los Angeles Co. line	117,496	123,911	116,136	105,389	18,522	10,747	123,995	18,606	105,389	90.7%
S.R. 22 (Garden Grove Fwy) between S.R. 55 and Valley View St.	374,752	395,212	303,297	302,934	92,278	363	614,368	315,250	299,118	98.6%
Subtotal Projects	1,638,766	1,728,239	1,428,720	1,414,968	313,271	13,752	1,823,768	462,754	1,361,014	
Net (Bond Revenue)/Debt Service			308,496	308,496	(308,496)	-	238,063		238,063	
Total Freeways	$ 1,638,766	$ 1,728,239	$ 1,737,216	$ 1,723,464	$ 4,775	$ 13,752	$ 2,061,831	$ 462,754	$ 1,599,077	
%				42.9%					47.8%	
Regional Street and Road Projects (11%)										
Smart Streets	$ 143,732	$ 151,580	$ 149,197	$ 149,197	$ 2,383	$ -	$ 166,079	$ 11,195	$ 154,884	103.8%
Regionally Significant Interchanges	83,844	88,422	88,422	88,422	-	-	63,144	146	62,998	71.2%
Intersection Improvement Program	119,777	126,316	126,316	126,316	-	-	82,540	214	82,326	65.2%
Traffic Signal Coordination	59,888	63,158	63,158	63,158	-	-	50,205	132	50,073	79.3%
Transportation Systems Management and Transportation Demand Management	11,978	12,632	12,632	12,632	-	-	7,707	149	7,558	59.8%
Subtotal Projects	419,219	442,108	439,725	439,725	2,383	-	369,675	11,836	357,839	
Net (Bond Revenue)/Debt Service			2,383	2,383	(2,383)	-	1,839		1,839	
Total Regional Street and Road Projects	$ 419,219	$ 442,108	$ 442,108	$ 442,108	$ -	$ -	$ 371,514	$ 11,836	$ 359,678	
%				11.0%					10.8%	

Measure M
Schedule of Revenues and Expenditures Summary
as of March 31, 2010

Project Description	Net Tax Revenues Program to date Actual	Total Net Tax Revenues	Project Budget	Estimate at Completion	Variance Total Net Tax Revenues to Est at Completion	Variance Project Budget to Est at Completion	Expenditures through Mar 31, 2010	Reimbursements through Mar 31, 2010	Net Project Cost	Percent of Budget Expended
(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)	(Q)
($ in thousands)										
Local Street and Road Projects (21%)										
Master Plan of Arterial Highway Improvements	$ 146,254	$ 159,700	$ 159,700	$ 159,700	$ -	$ -	$ 97,086	$ 99	$ 96,987	60.7%
Streets and Roads Maintenance and Road Improvements	554,073	584,324	584,324	584,324	-	-	552,142	-	552,142	94.5%
Growth Management Area Improvements	100,000	100,000	100,000	100,000	-	-	77,880	431	77,449	77.4%
Subtotal Projects	800,327	844,024	844,024	844,024	-	-	727,108	530	726,578	
Net (Bond Revenue)/Debt Service							-		-	
Total Local Street and Road Projects	$ 800,327	$ 844,024	$ 844,024	$ 844,024	$ -	$ -	$ 727,108	$ 530	$ 726,578	
%				21.0%					21.7%	
Transit Projects (25%)										
Pacific Electric Right-of-Way	$ 18,441	$ 19,448	$ 15,000	$ 14,000	$ 5,448	$ 1,000	$ 16,661	$ 2,808	$ 13,853	92.4%
Commuter Rail	342,668	362,468	346,407	377,772	(15,304)	(31,365)	351,437	60,805	290,632	83.9%
High-Technology Advanced Rail Transit	417,990	440,811	421,278	410,688	30,123	10,590	175,034	7,409	167,625	39.8%
Elderly and Handicapped Fare Stabilization	20,000	20,000	20,000	20,000	-	-	19,000	-	19,000	95.0%
Transitways	153,673	162,063	146,381	126,606	35,457	19,775	162,651	36,765	125,886	86.0%
Subtotal Projects	952,772	1,004,790	949,066	949,066	55,724	-	724,783	107,787	616,996	
Net (Bond Revenue)/Debt Service			55,724	55,724	(55,724)	-	43,001		43,001	
Total Transit Projects	$ 952,772	$ 1,004,790	$ 1,004,790	$ 1,004,790	$ -	$ -	$ 767,784	$ 107,787	$ 659,997	
%				25.0%					19.7%	
Total Measure M Program	$ 3,811,084	$ 4,019,161	$ 4,028,138	$ 4,014,386	$ 4,775	$ 13,752	$ 3,928,237	$ 582,907	$ 3,345,330	

See accompanying notes to Measure M Schedules

Presentation Items

OCTA

BOARD COMMITTEE TRANSMITTAL

May 24, 2010

To: Members of the Board of Directors

From: Wendy Knowles, Clerk of the Board

Subject: Measure M2 Environmental Cleanup Program – A Two-Tier Grant Funding Approach

Transportation 2020 Committee Meeting of May 17, 2010

Present: Directors Amante, Brown, Campbell, Cavecche, Dixon, and Pringle
Absent: Director Buffa

Committee Vote

This item was passed by all Committee Members present.

Committee Recommendations

A. Approve the recommended two-tier grant funding approach.

B. Approve the recommended funding plan to make available from fiscal year 2011-12 through fiscal year 2017-18 up to $19.5 million in Tier 1 grants on a "pay-as-you-go" basis, and up to $38 million from fiscal year 2011-12 through fiscal year 2014-15 in Tier 2 grants by financing with the conditions specified in the staff report.

C. Approve the attached draft funding guidelines for the Tier 1 Grant Program.

D. Approve planning and research for the development of best management practices implementation strategies related to the development of the funding guidelines for the Tier 2 Grant Program.

OCTA

May 17, 2010

To: Transportation 2020 Committee

From: Will Kempton, Chief Executive Officer

Subject: Measure M2 Environmental Cleanup Program – A Two-Tier Grant Funding Approach

Overview

The Orange County Transportation Authority's Environmental Cleanup Program, Project X, provides for the allocation of 2 percent of annual Measure M2 revenues to improve overall water quality from transportation-generated pollution. The Environmental Cleanup Allocation Committee is recommending a two-tier grant funding approach. Details on the funding approach are presented for Board of Directors' review and approval.

Recommendations

A. Approve the recommended two-tier grant funding approach.

B. Approve the recommended funding plan to make available from fiscal year 2011-12 through fiscal year 2017-18 up to $19.5 million in Tier 1 grants on a "pay-as-you-go" basis, and up to $38 million from fiscal year 2011-12 through fiscal year 2014-15 in Tier 2 grants by financing with the conditions specified in the staff report.

C. Approve the attached draft funding guidelines for the Tier 1 Grant Program.

D. Approve planning and research for the development of best management practices implementation strategies related to the development of the funding guidelines for the Tier 2 Grant Program.

Background

The Environmental Cleanup Program (Project X) provides for the allocation of 2 percent of annual gross Measure M2 (M2) revenues to improve overall water quality in Orange County from transportation-generated pollution.

On October 22, 2007, the Orange County Transportation Authority (OCTA) Board of Directors (Board) approved the membership for the Environmental Cleanup Allocation Committee (Allocation Committee). The Allocation Committee provides guidance on program design and funding. The Allocation Committee includes representatives from a broad cross-section of the water quality community as specified in the Renewed Measure M Ordinance (Attachment A).

The M2 funds attributed to Project X are to be allocated on a countywide competitive basis to assist jurisdictions in meeting the Clean Water Act standards for controlling transportation-generated pollution. The funds are designed to supplement, not supplant, existing transportation-related water quality programs. Funds will be awarded to the highest priority projects that improve water quality in streams, harbors, and other waterways that have a nexus to transportation-generated pollution consistent with OCTA's Ordinance No. 3.

Discussion

Available Funding

Since M2 passed in November 2006, OCTA has received significant revisions to the sales tax revenue forecasts. The table below shows the differences for the 30-year (fiscal years {FY} 2011 to 2041) estimated revenues for the program:

M2 Project X Revenue Forecast – 30 years
(millions of nominal dollars)

Original	2009 Forecast	Difference
$486	$284	$202

The 30-year forecasts have declined by approximately 40 percent due to the current economic downturn, and the allocation program has been adjusted to account for the new financial conditions.

Two-Tiered Grant Funding Approach

The Allocation Committee has made significant progress in the development of the program since forming in fall 2007 (Attachment B). The recommended strategy for use of the funds is comprised of a two-tier funding process to focus on early priorities (Tier 1) and prepare for more comprehensive investments (Tier 2):

- The Tier 1 Grant Program is designed to mitigate the more visible form of pollutants, such as litter and debris that collects on the roadways and

in the catch basins (storm drains) prior to being deposited in waterways and the ocean. It consists of funding for equipment purchases and upgrades to existing catch basins and related best management practices (BMP) such as screens, filters, and inserts.

- The Tier 2 Grant Program consists of funding regional, potentially multi-jurisdictional, capital-intensive projects. Examples include, but are not limited to, constructed wetlands, detention/infiltration basins, and bioswales, which mitigate pollutants including litter and debris, but also heavy metals, organic chemicals, sediment, nutrients, and pathogenic material.

Tier 1 Grant Program

In July 2008, OCTA conducted a countywide survey of the cities. This survey solicited a number of questions related to catch basins on each city's corresponding BMP program. Based on this survey, more than nine out of ten cities indicated interest in applying for funds. Another key finding was that less than 10 percent of catch basins in Orange County have some type of device to screen trash and debris.

In December 2008, OCTA initiated the preparation of the funding guidelines (Attachment C) for the Tier 1 Grant Program. These guidelines will be used by eligible local agencies to prepare project applications and submit funding requests.

The Tier 1 Grant Program Funding Guidelines have been drafted similar to current Measure M funding guidelines for street projects (Combined Transportation Funding Program). To be eligible for funding, the Allocation Committee has developed prerequisites that all applicants must meet, which are summarized in Section 1.0 of Attachment C.

The Allocation Committee has recommended the approval of a funding plan of up to $19.5 million on a pay-as-you-go basis from FY 2011-12 through FY 2017-18. The Allocation Committee has also expressed an interest in using commercial paper (CP) to meet short-term cash flow needs for the Tier 1 projects. Specifically, the Allocation Committee recommended that to the extent that annual pay-as-you-go revenues are not sufficient to meet Tier 1 cash flow needs, CP could be used as a short-term financial instrument, up to a period of one year. This request will be considered as part of OCTA's update to the plan of finance, scheduled for Finance and Administration Committee and Board review in May/June 2010.

Based on the countywide survey, it is estimated that the Tier 1 Grant Program could be completed by FY 2017-18. Matching funds from the eligible agencies will be required at 25 percent of the total project costs.

The following is the anticipated timeline for the call for projects (call) related to the Tier 1 Grant Program:

- Fall 2010 – Issue call
- Winter 2010 – Project evaluation
- Spring 2011 – Board award of projects
- Summer 2011 – Project implementation

Tier 2 Grant Program

The Allocation Committee has discussed the development of early funding priorities for a Tier 2 Grant Program, which consists of funding purchases and installation of structural BMPs on a regional, multi-jurisdictional level. In the past, the implementation of structural BMPs for stormwater mitigation in Orange County has been largely ad hoc and site specific. Projects are usually completed to comply with specific funding or regulatory requirements, and often focus on only one or two pollutants (or sources), which may be localized, not regional in nature.

Currently, there is no water quality master plan to guide where M2 investments are needed, nor is there a model to assess BMP cost effectiveness. To address these limitations, information is needed to estimate costs, benefits, and impacts of BMPs on a watershed basis, as well as where the BMPs will have the greatest effect. As such, further research and planning is needed to assess viable BMPs options before a call for Tier 2 projects.

The Allocation Committee has recommended a Tier 2 Grant Program planning study (Study) to determine the most strategically effective areas and types of investment to reduce road/freeway runoff impacts to impaired waters in Orange County (Attachment D). The Study will utilize an integrated geographical information system model that will result in an overall master plan. This overall master plan will guide capital improvement program development, investment decisions, and ranking/evaluation of the Tier 2 Grant Program.

A comprehensive scope of work for the Study is under development, which will be a cooperative effort with Orange County's Watershed and Coastal Program. It is estimated that professional services necessary to complete this Study requires a budget of $500,000, which is included in the proposed

FY 2010-11 budget. Further, a policy framework for the Tier 2 Grant Program will be recommended in winter 2010, based on the outcome of the Study.

The Allocation Committee has recommended that the Tier 2 Grant Program be funded beginning in FY 2011-12 via bonding with up to $38 million allocated through FY 2014-15. Beyond FY 2014-15, funding will be based on a pay-as-you-go basis. To further augment the amount of total funding available to all interested eligible jurisdictions, a 50 percent matching fund is recommended. Eligible jurisdictions will have two options to meet the minimum match option. For option one, an eligible jurisdiction can apply for full funding from the onset of the project to construction, having a required match of 50 percent. For option two, an eligible jurisdiction can apply for funding for an environmentally cleared project and may utilize the project development costs up to environmental clearance as credit against the 50 percent match. The Tier 2 funding guidelines are anticipated to be recommended for approval by the Board in December 2010.

The following is the anticipated timeline for the call related to the Tier 2 Grant Program at the onset of M2 funding.

- Early 2011 – Issue call
- Early 2011 – Allocation Committee's project evaluation
- Spring 2011 – Board award of projects
- Summer 2011 – Project implementation

Summary

The Allocation Committee has recommended a two-tier funding program of projects having a transportation pollution nexus. The development of the funding guidelines for the Tier 1 Grant Program, a localized capital program for BMPs for catch basins, has been completed. The Tier 1 Grant Program's initial funding call is anticipated in fall 2010, with the onset of funding in summer of 2011.

The Tier 2 Grant Program, a regional capital intensive program for larger BMPs, will require additional planning and research. This will include modeling by a study to help determine the most strategically effective areas and types of investments necessary to reduce transportation related runoff impacts within Orange County. It is anticipated the guidelines for the Tier 2 Grant Program will be recommended in winter 2010, with the onset of funding in summer of 2011.

Attachments

A. Environmental Cleanup Allocation Committee Roster
B. Measure M2 Environmental Cleanup Program Timeline – Water Quality Program – Project X
C. Orange County Transportation Authority - Measure M2 Environmental Cleanup Program - Draft Funding Guidelines - Tier 1 Grant Program
D. Orange County Transportation Authority Fact Sheet – Measure M2 Environmental Cleanup Program – Proposed Tier 2 Grant Program Planning Study

Prepared by:

Hal McCutchan
Environmental Programs Manager
(714) 560-5759

Approved by:

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

ATTACHMENT A

Environmental Cleanup Allocation Committee Roster

Private/Non-Profit Environmental Organization (1)

Garry Brown, Chair
President & Chief Executive Officer
Orange County Coastkeeper

County of Orange (1)

Mary Anne Skorpanich, Vice-Chair
Director
Watershed and Coastal Resources Program

Supervisorial District – Cities (5)

John Bahorski
City Manager
City of Cypress

Tim Casey
City Manager
City of Laguna Niguel

Gene Estrada
Water Quality Coordinator
City of Orange

Joe Parco
Senior Civil Engineer
City of Santa Ana

Dick Wilson
Environmental Services Manager
City of Anaheim

Scientific/Academic (1)

Dr. William Cooper
Professor
UC Irvine

CA Department of Transportation (1)

Hector Salas
Associate Environmental Planner
Water Quality Storm Water Unit

Water/Wastewater Public Entity (2)

Paul Jones
General Manager
Irvine Ranch Water District

Tom Rosales
General Manager
Southern California Waste Water Authority

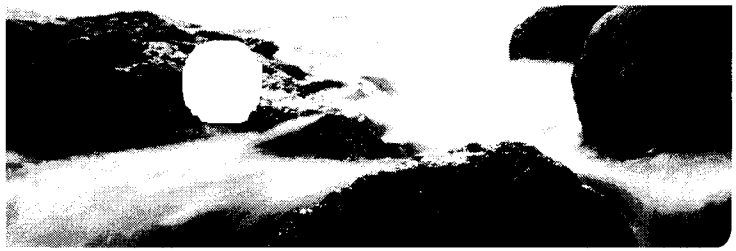
Development Industry (1)

Sat Tamaribuchi
Consultant

Non-Voting (2)

James Smith
Northern Watershed Unit Supervisor
San Diego Regional Water Quality Control District

Mark Adelson
Senior Environmental Scientist
Santa Ana Regional Water Quality Control District



Measure M Environmental Cleanup Program Timeline

Water Quality Program, Project X

Enhancing Water Quality for Orange County's Future

Purpose: Assist local agencies via a funding mechanism (2% of gross Measure M2 revenues) to meet water quality standards associated with transportation-related activities.

FY 08-09

Phase 1 - Program Development

- Formed technical committee to provide recomendations to Board of Directors (Board)
- Established water quality funding parameters
- Defined transportation pollution nexus

FY 08-09

Phase 2 - Assessment

- Completed two citywide storm drain surveys: indicating 93% of catch basins are unprotected
- Identified Tier 1 Program: localized best management practices (BMP) upgrade funding for catch basins
- Identified Tier 2 Program: funding for multijurisdictional, multi-year capital intensive BMP projects

FY 09-10

Phase 3a - Draft Policy Guidelines

- Eligible Jurisdictions*
- Maintenance of Efforts*
- Matching Funding Requirements*
- Performance Metrics*
- Cooperative Agreements
- Capital Improvement Program Policies
- Funding Allocation and Reimbursement Process

FY 09-10

Phase 4a - Tier 2 Program Planning Study

- Cooperative study with County
- Determines the most strategically effective areas and investments to reduce road/freeway runoff impacts to waterways
- Results in overall master plan to guide capital improvement program development, investment decisions, and ranking/evaluation

Phase 3b - Implementation for Tier 1 Programs

- Board Approval of Guidelines (Spring 2010)
- Issue Call for Projects (Fall 2010)
- Project Evaluation (Winter 2010)
- Board Award of Projects (Spring 2011)
- Project Implementation (Summer 2011)

Phase 4b - Implementation for Tier 2 Programs

- Tier 2 Program Planning Study (Late 2010)
- Refined Program Framework/General Requirements (Late 2010)
- Issue Call for Projects, (Early 2011)
- Project Evaluation, (Early 2011)
- Board Award of Projects (Spring 2011)
- Project Implementation (Summer 2011)

*Required by Measure M2.

Attachment B

ATTACHMENT C

ORANGE COUNTY TRANSPORTATION AUTHORITY

MEASURE M2 ENVIRONMENTAL CLEANUP PROGRAM

DRAFT FUNDING GUIDELINES

TIER 1 GRANT PROGRAM

IS AVAILABLE ON THE OCTA WEBSITE (WWW.OCTA.NET)

AND AVAILABLE UPON REQUEST

FROM THE CLERK OF THE BOARD'S OFFICE

ATTACHMENT D

OCTA

Orange County Transportation Authority
Fact Sheet

Measure M2 Environmental Cleanup Program
Proposed Tier 2 Grant Program Planning Study

The Measure M2 (M2) Environmental Cleanup Committee (Allocation Committee) has discussed the development of early funding priorities for a Tier 2 Grant Program. The Tier 2 Grant Program would consist of funding purchases and installation of structural best management practices (BMPs) on a regional, multi-jurisdictional level. Examples of potential BMPs that may be funded include constructed wetlands, detention/infiltration basins, bioswales, etc.

In the past, the implementation of structural BMPs for stormwater mitigation in Orange County has been largely opportunistic and site specific. Projects are usually completed in response to a specific funding opportunity or regulatory requirements, and often focus on only one or two pollutants (or sources), which may be localized and not regional in nature.

At this time, there is no available water quality master plan to guide where M2 investments are needed nor is there a methodology to test the BMP cost-effectiveness for potential funding opportunities. The Allocation Committee has proposed a Tier 2 Grant Program Planning Study (Study), which will utilize an integrated geographical information system (GIS) model for developing BMP implementation strategies that further efforts in developing the program's funding guidelines.

The overall objectives for the Study would be to:

- Assist the Allocation Committee in evaluating benefits and cost-effectiveness of submitted projects.
- Provide guidance for eligible agencies on required information related to Tier 2 Grant Program funding applications.
- Identify the most efficient BMPs that will result in pollutant mitigation.
- Develop an initial capital improvement program to systematically plan, schedule, and finance transportation-related water quality improvement projects.
- Provide a multi-jurisdiction partnership for leveraging other funding grants opportunities.

A multi-agency approach with Orange County's Watershed and Coastal Resources Program is proposed to develop this methodology on a watershed level to maximize improvements in stormwater. It is estimated that consulting services to complete this planning study would be up to $500,000 with completion in a six-month period.

OCTA

BOARD COMMITTEE TRANSMITTAL

May 24, 2010

To: Members of the Board of Directors

From: Wendy Knowles, Clerk of the Board

Subject: Countywide Pavement Management Program Guidelines

Transportation 2020 Committee Meeting of May 17, 2010

Present: Directors Amante, Brown, Buffa, Campbell, Cavecche, Dixon, and Pringle
Absent: None

Committee Vote

This item was passed by all Committee Members present.

Committee Recommendation

Approve the Countywide Pavement Management Program Guidelines.

Committee Discussion

The Committee Members approved the Countywide Pavement Management Program Guidelines with the following revision in verbiage for Chapter 1.Overview, page 1*.

This reflects a previous "a and b", now appearing as "a," and renaming "c" as "b":

Section 1.2. Local Match Reduction

In addition to the above requirements, a local match reduction of 10% of the eligible cost is available if the local jurisdiction either:

a. Shows measurable improvement of paved road conditions during the previous reporting period defined as an overall weighted (by area) average system improvement of one Pavement Condition Index (PCI) point with no reduction in the overall weighted (by area) average PCI in the Master Plan of Arterial Highways (MPAH) or local street categories;

- or -

b. Have road pavement conditions during the previous reporting period within the highest 20% of the scale for road pavement conditions in conformance with OCTA Ordinance No. 3, defined as a PCI of 75 or higher.

* *This verbiage also appears on pages 12 and 13 of the guidelines and will be revised accordingly.*

OCTA

May 17, 2010

To: Transportation 2020 Committee

From: Will Kempton, Chief Executive Officer

Subject: Countywide Pavement Management Program Guidelines

Overview

The Orange County Transportation Authority has undertaken an effort to develop a countywide pavement management system as required by Measure M2. The comprehensive program guidelines are presented for Board of Directors' review and approval.

Recommendation

Approve the Countywide Pavement Management Program Guidelines.

Background

Each local jurisdiction is required to adopt and fund a pavement management plan (PMP) in order to be eligible to receive Measure M2 (M2) funding. Additionally, a local match reduction of 10 percent for competitive Regional Capacity Program projects is available if a local agency has measureable improvements in paved road conditions or maintains road pavement conditions within the highest 20 percent of the scale for road pavement conditions countywide.

The countywide assessment of existing and future pavement needs, completed by the Orange County Transportation Authority (OCTA) in 2006, demonstrated the benefits of establishing uniform criteria for local PMP systems. The report noted that the different pavement condition data collection efforts and evaluation methodologies used by local agencies make it difficult to evaluate countywide pavement conditions. As a result, M2 established requirements for developing consistent methodology for local agency pavement management programs (Attachment A).

After a review of pavement management software currently in use and the benefits of a single system, the Technical Advisory Committee (TAC), at its

meeting of July 23, 2008, approved MicroPaver as the countywide pavement software. This software was already being utilized by 20 of the 35 local agencies. The Board of Directors approved the M2 Eligibility Guidelines on January 25, 2010, which included the use of MicroPaver as part of the requirements to receive M2 funds. Guidelines have now been developed to implement and administer the pavement management program in Orange County and are presented for approval.

Discussion

The PMP guidelines (Attachment B) are intended to provide reliable means of assessing pavement conditions countywide, both for the Master Plan Arterial Highways and the local street systems. These guidelines are also intended to track changes in pavement conditions, forecast expected improvements resulting from the local agencies' maintenance and rehabilitation plans, and identify alternative strategies and funding necessary to improve road pavement conditions. Reliable, consistent, and uniform pavement data collection practices are essential to ensure the long term success of the program.

Each local agency must adopt and update biennially its PMP consistent with the specific requirements of M2, and issue a report every two years regarding status of road pavement conditions and implementation of the PMP. To establish eligibility for receipt of M2 funds, each jurisdiction must submit a copy of the local PMP certification form to OCTA during the annual eligibility review cycle. The PMP submittal must also include a brief overview highlighting conditions that may have developed between review cycles and provide information concerning projects funded as part of the PMP.

The pavement management guidelines address: 1) the methodology used to collect pavement information as well as the frequency of inspections; 2) the specific measures that quantify pavement conditions; and 3) the types and quality of information local agencies should provide to OCTA. These requirements are generally the same as those provided as part of the current Measure M eligibility process. The TAC approved the guidelines on April 28, 2010.

Summary

The Countywide Pavement Management Program Guidelines Manual has been developed to satisfy the requirements of M2 for a system that will provide reliable, consistent, and comparable road pavement data. The guidelines will assist in determining current road pavement conditions and projecting future needs.

Attachments

A. Orange County Local Transportation Authority Ordinance No. 3 – July 24, 2006 – Section III. 7., page B-8 and Section V. A.1.b.(i)(ii), page B-12
B. Draft Countywide Pavement Management Program Guidelines Manual

Prepared by:

Harry W. Thomas
Project Manager
(714) 560-5617

Approved by:

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

ATTACHMENT A

ORANGE COUNTY LOCAL TRANSPORTATION AUTHORITY

ORDINANCE NO. 3

JULY 24, 2006

Section III. 7., page B-8 and Section V. A.1.b.(i)(ii), page B-12

Orange County Local Transportation Authority
550 South Main Street
P.O. Box 14184
Orange, CA 92863-1584
Tel: (714) 562-6282

and phasing of capital, operations and maintenance of the street routes and traffic signals; and include information on how the street routes and traffic signals may be synchronized with traffic signals on the street routes in adjoining jurisdictions. The Local Traffic Signal Synchronization Plan shall be consistent with the Traffic Signal Synchronization Master Plan.

7. Pavement Management Plan. Adopt and update biennially a Pavement Management Plan, and issue, using a common format approved by the Authority, a report every two years regarding the status of road pavement conditions and implementation of the Pavement Management Plan.

a. Authority, in consultation with the Eligible Jurisdictions, shall define a countywide management method to inventory, analyze and evaluate road pavement conditions, and a common method to measure improvement of road pavement conditions.

b. The Pavement Management Plan shall be based on: either the Authority's countywide pavement management method or a comparable management method approved by the Authority, and the Authority's method to measure improvement of road pavement conditions.

c. The Pavement Management Plan shall include:

(i) Current status of pavement on roads;

(ii) A six-year plan for road maintenance and rehabilitation, including projects and funding;

(iii) The projected road pavement conditions resulting from the maintenance and rehabilitation plan; and

(iv) Alternative strategies and costs necessary to improve road pavement conditions.

8. Expenditure Report. Adopt an annual Expenditure Report to account for Net Revenues, developer/traffic impact fees, and funds expended by the Eligible Jurisdiction which satisfy the Maintenance of Effort requirements. The Expenditure

described in the Plan, the Authority may allocate the Net Revenues replaced by the receipt of those additional funds, in the following order of priority: first, to Plan projects and programs which provide congestion relief in the geographic region which received the additional funds; second, to other projects and programs within the affected geographic region which may be placed in the Plan through an amendment to the Ordinance; and third, to all other Plan projects and programs.

H. Upon review and acceptance of the Project Final Report, the Authority shall allocate the balance of Net Revenues for the project, less the interest earned on the Net Revenues allocated for the project.

V. ALLOCATION OF NET REVENUES; STREETS AND ROADS PROGRAMS/ PROJECTS

A. Regional Capacity Program.

1. Matching Funds. An Eligible Jurisdiction shall contribute local matching funds equal to fifty percent (50%) of the project or program cost. This local match requirement may be reduced as follows:

a. A local match reduction of ten percent (10%) of the eligible cost if the Eligible Jurisdiction implements, maintains and operates in conformance with the Traffic Signal Synchronization Master Plan.

b. A local match reduction of ten percent (10%) of the eligible cost if the Eligible Jurisdiction either:

(i) has measurable improvement of paved road conditions during the previous reporting period as determined pursuant to the Authority's method of measuring improvement of road pavement conditions, or

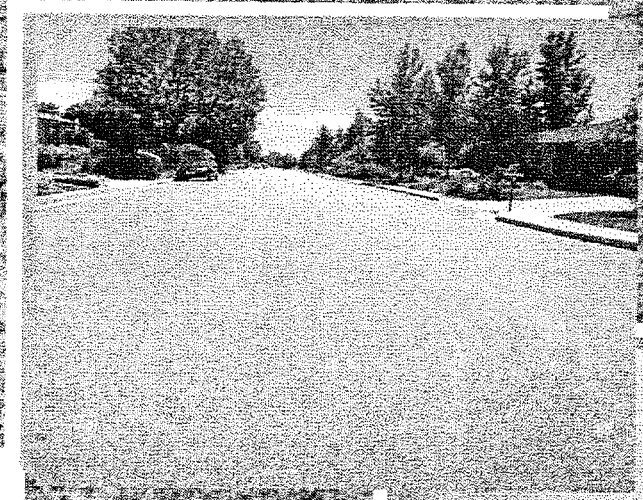
(ii) has road pavement conditions during the previous reporting period which are within the highest twenty percent of the scale for road pavement conditions as determined pursuant to the Authority's method of measuring improvement of road pavement conditions.

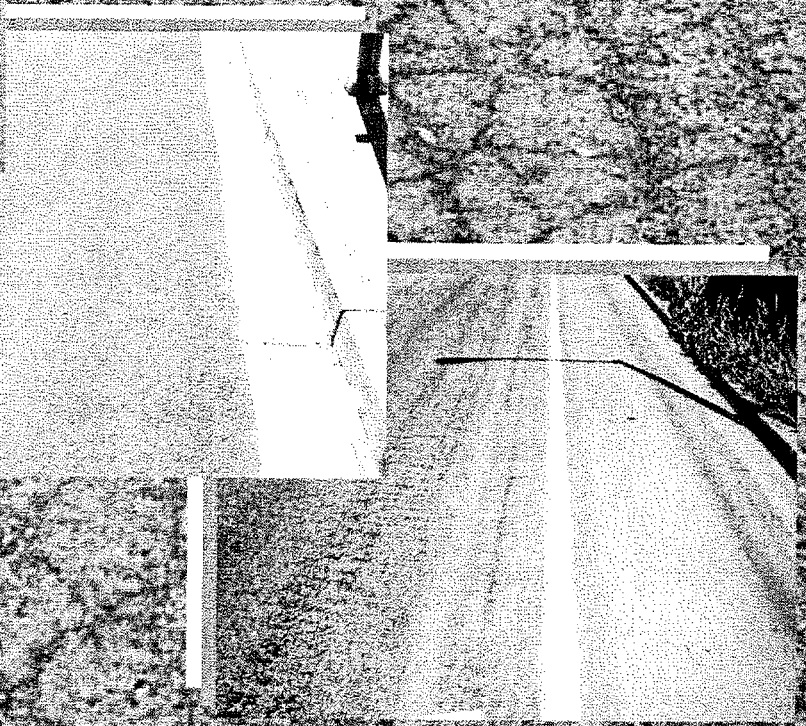
c. A local match reduction of five percent (5%) of the

ATTACHMENT B

Countywide Pavement Management Program

Guidelines Manual





May 5, 2010

Nichols Consulting Engineers, Chtd.
Engineering & Environmental Services

Countywide Pavement Management Program

Guidelines Manual

Submitted to:

Orange County Transportation Authority
550 South Main Street
P.O. Box 14184
Orange, CA 92863

May 5, 2010

Nichols Consulting Engineers, Chtd.
Engineering & Environmental Services

Table of Contents

Chapter 1. Overview

On November 6, 1990, the voters in Orange County approved a ½-cent sales tax for transportation improvements known as Measure M. This sales tax includes funding for streets and roads that is available to local agencies through both a formula distribution and a competitive process. On November 6, 2006, voters approved a renewal of Measure M to continue the ½-cent sales tax for thirty years, beginning in 2011.

1.1. Eligibility Requirements

One of the eligibility requirements included in the Renewed Measure M specifies that each local jurisdiction must adopt and update a Pavement Management Plan (PMP) every two years. All agencies must use a common format as part of the countywide pavement management effort. The PMP must include:

- The current status of road pavement conditions;
- A seven-year plan for road maintenance and rehabilitation (including projects and funding);
- The projected pavement condition resulting from the maintenance and rehabilitation plan; and
- Alternative strategies and costs necessary to improve road pavement conditions.

1.2. Local Match Reduction

In addition to the above requirements, a local match reduction of 10% of the eligible cost is available if the local jurisdiction either:

a. Shows measurable improvement of paved road conditions during the previous reporting period defined as an overall weighted (by area) average system improvement of one Pavement Condition Index (PCI) point.

b. No reduction in the overall weighted (by area) average PCI in the Master Plan of Arterial Highways (MPAH) or local street categories;

– or –

c. Have road pavement conditions during the previous reporting period within the highest 20% of the scale for road pavement conditions in conformance with OCTA Ordinance No. 3 (i.e. PCI ≥75).

1.3. Background

The primary goal of these guidelines is to ensure consistent field data collection procedures so that countywide funding allocations can be made using an "apples and apples" comparison. The key is to ensure a reliable, consistent and uniform approach to data collection.

The key is to ensure a reliable, consistent and uniform approach to data collection.

Once all agencies are using uniform data collection procedures, OCTA can then answer typical questions such as:

- What is the average countywide conditions of local streets and roads? For individual streets?
- Which streets have a higher priority and need to be funded first?
- How much does it cost to bring them up to an acceptable condition?
- How much will it cost to maintain them in an acceptable condition over the next 5, 10 or 25 years?
- What are the impacts on condition at the existing funding levels?

In order to determine current practices in the County, Nichols Consulting Engineers, Chtd. (NCE) developed a survey questionnaire which contained questions ranging from identifying the Pavement Management System (PMS) software, pavement survey cycles, pavement distresses collected, quality control/quality assurance (QC/QA) procedures, and pavement treatment policies/unit costs. The main questions in the questionnaire included:

1. Current PMS program i.e. what does the database contain?
2. Typical inspection cycles
3. Last pavement condition survey (when and by whom?)
4. QC process for pavement condition survey
5. Survey methodology
6. Types of distresses collected
7. Pavement condition rating scale used
8. Triggers/thresholds for different maintenance treatments
9. Prioritization process used to select sections for treatment
10. Components used to calculate treatment unit costs
11. Pavement prediction models (deterioration curves)
12. Inventories for other assets maintained

Appendix A contains the results of the survey questionnaire that was distributed by OCTA to all local agencies in June 2009. All 35 agencies responded. Based on the results of this survey, guidelines were developed, and these are further described in Chapter 3.

1.4. Procedures Manual Overview

This manual provides guidelines and procedures necessary for Orange County agencies to implement and update their pavement management plans with respect to conducting condition surveys. This is required to certify that they are in conformance with the criteria stated in OCTA's Ordinance No. 3. This ordinance requires that a pavement management plan be in place and maintained to qualify for allocation of revenues generated from Measure M and M2. A copy of Ordinance No. 3 is available from OCTA. A copy of the pavement management program (PMP) certification is included in Appendix B. This is part of the submittals required for each agency (see Chapter 3).

Chapter 2. Pavement Management Program Guidelines

The pavement management guidelines are discussed under the following categories:

1. Condition survey protocols
2. Inspection frequency
3. Countywide Assessment Standards
4. QC/QA plan
5. Re-inspections
6. Prequalification/calibration of inspectors
7. Pavement management software training
8. MicroPAVER data files

2.1. Condition Survey Protocols

In 1998, OCTA adopted condition survey protocols that required the collection of the following distresses as a minimum for both asphalt concrete and Portland cement concrete pavements as follows:

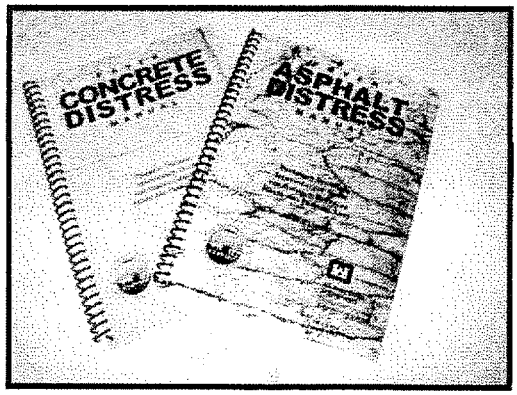
Asphalt Concrete (AC)

1. Alligator/fatigue cracking
2. Bleeding/flushing
3. Block cracking
4. Edge cracking
5. Longitudinal and transverse cracking
6. Patching and utility cuts
7. Raveling and weathering
8. Rutting

Portland Cement Concrete (PCC)

1. Corner breaks
2. Durability "D" cracking
3. Joint sealant damage
4. Joint and corner spalling
5. Longitudinal and transverse cracking (both non-reinforced and reinforced slabs)
6. Popouts
7. Shrinkage cracking

The definitions for severity levels as well as how to measure the extents were based on criteria described in *Pavement Management for Airports, Roads and Parking Lots*[1]. This reference was later formalized as ASTM Standard D6433-09[2] (ASTM is the American Society for Testing and Materials. ASTM's copyright does not allow for electronic distribution of this standard, and so a copy of this standard has not been included as part of this document. However, a link to purchase the standard is included in the footnote.) OCTA's guidelines follow ASTM D6433-09, with a few minor exceptions as noted below.



In addition, field manuals are available and are reproduced in Appendix C[3,4]. The field manuals also include photographs of distress types and detailed descriptions and definitions, and are intended for the field inspector. Local jurisdictions may purchase copies of these manuals from the American Public Works Association (APWA) at a nominal price. All personnel involved with inspection or performing condition surveys must have read and understood these manuals.

Note that both ASTM D6433-09 and these field manuals contain 19 pavement distresses each for AC and PCC pavements. The additional distresses that are not included in OCTA's list are not required for data collection.

Table 2.1 on the next page relates the required OCTA distresses with the appropriate sections of both the MicroPAVER manuals as well as ASTM D6433-09.

OCTA allows two types of surveys, windshield and walking surveys. As a minimum, windshield surveys should be conducted and supplemented with walking surveys. In a windshield survey, the inspector travels in a vehicle at slow speeds (5 to 10 mph) and observes the pavement condition from within the vehicle. The entire length of the pavement section is driven and observed. A driver is required for safety reasons, with the inspector/recorder in the passenger side of the vehicle. The inspector should have a list of street sections to be surveyed and a route planned in advance.

Again, the entire pavement section is surveyed and the distress data are estimated and recorded. In situations where the distresses need closer examination, or where there are difficulties in observation, the inspector should stop the vehicle and walk the pavement section to verify the distresses observed from the vehicle.

---

[1] Shahin, M.Y. *Pavement Management for Airports, Roads and Parking Lots*, Chapman & Hall, 1994.
[2] *ASTM D6433-09 – Standard Practice for Roads and Parking Lots Pavement Condition Index Surveys. A copy may be purchased at http://www.astm.org/Standards/D6433.htm.*
[3] *Paver Asphalt Distress Manual: Pavement Distress Identification Guide for Asphalt-Surfaced Roads and Parking Lots*, U.S. Army Corps of Engineers, Construction Engineering Research Laboratories, TR 97/104, June 1997. To purchase, go to www.apwa.net.
[4] *Paver Concrete Distress Manual: Pavement Distress Identification Guide for Jointed Concrete Roads and Parking Lots*, U.S. Army Corps of Engineers, Construction Engineering Research Laboratories, TR 97/105, June 1997. To purchase, go to www.apwa.net.

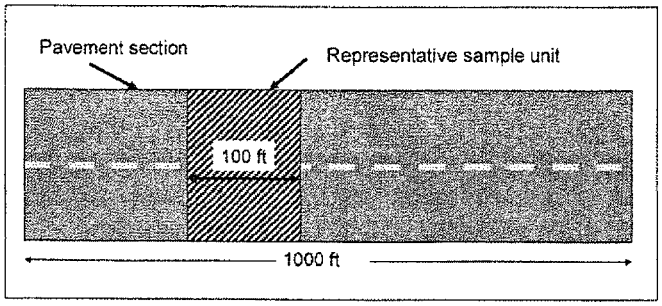
Table 2.1 OCTA and Related MicroPAVER & ASTM D6433-09 Distress Descriptions

Pavement Distress	MicroPAVER Distress Manuals	ASTM D6433-09 Sections #
AC Distresses		
Alligator/fatigue cracking	Distress Code 1, 13	X1.5 & X1.17
Bleeding/flushing	Distress Code 2	X1.6
Block cracking	Distress Code 3	X1.7
Edge cracking	Distress Code 7	X1.11
Longitudinal & transverse cracking	Distress Codes 8, 10, 17	X1.12, X1.14 & X1.21
Patching & utility cuts	Distress Code 11	X1.15
Raveling & weathering	Distress Code 19	X1.23 & X1.24
Rutting	Distress Code 15	X1.19
PCC Distresses		
Corner breaks	Distress Code 22	X2.4
Durability "D" cracking	Distress Code 24	X2.6
Joint sealant damage	Distress Code 26	X2.8
Joint & corner spalling	Distress Codes 38, 39	X2.20 & X2.21
Longitudinal & transverse cracking	Distress Code 28	X2.10
Popouts	Distress Code 32	X2.14
Shrinkage cracking	Distress Code 37	X2.19

All field data collection procedures should conform to the local agency's safety practices and should be included in the QC/QA Plan (see Section 2.4).

When walking surveys are used, the following procedure should be followed:

1. Each pavement section must be inspected using sample units. Individual sample units should be representative of the pavement section conditions, and may be marked or identified to allow easy location for quality control purposes. Paint marks along the edge or sketches with locations connected to physical pavement features are acceptable. The figure below illustrates the definition of a pavement section and a representative sample unit.



2. The area of AC sample units should be 2500±1500 square feet, and for PCC sample units, this should be 20±8 slabs. The total inspected area or slabs for a pavement section must add up to at least 10% of the total pavement section area or slabs. This is an exception to the procedure described in ASTM D6433.

   For example, a pavement section 950 feet long and 32 feet wide must have at least one sample unit (typically 100 feet long x 32 feet wide = 3200 sf). Longer sections will require multiple sample units.

3. Additional sample units are to be inspected only when non-representative distresses are observed. Typically, these will be distresses that are localized in nature and not representative of the entire pavement section e.g. high severity alligator cracking found near bus pads, rutting in intersections, distresses due to landscape watering/ponding etc.

4. Conduct the distress inspection by walking on the pavement or sidewalk/shoulder of the sample unit being surveyed, measuring the quantity of each severity level of every distress type present, and recording the data. Each distress must correspond in type and severity to that described in Appendix C.

5. A copy of the recorded distress data should be provided on a weekly basis to the responsible agency personnel for quality assurance.

Finally, it should be noted that windshield surveys, while reasonably fast and inexpensive, do have shortcomings. Chief among these are that low severity distresses are difficult to identify in this procedure, and consequently, the PCI may be significantly higher than it ought to be. A pavement may therefore be selected for a slurry seal when a thin overlay is more appropriate or for a thin overlay when a thick overlay is more appropriate. This may result in treatments that are not cost-effective.

For pavements that are a high priority (usually those with high traffic volumes or are connector routes) in an agency, windshield surveys are the minimum although walking surveys are preferred to ensure that all pertinent distresses are captured. For residential or local streets, windshield surveys are acceptable.

2.2. Inspection Frequency

All streets identified on the Master Plan for Arterial Highways (MPAH) must be surveyed at least once every two years. All local streets must be surveyed at least once every six years.

This is a requirement of OCTA's PMP certification program.

2.3. Countywide Assessment Standards

In 1998, OCTA adopted the countywide pavement condition assessment standards for treatments as shown in Table 2.2.

Table 2.2 Pavement Condition Assessment Standards

Pavement Quality	PCI Thresholds	Funded Treatment
Very Good	86-100	None
Good	75-85	Surface seal*
Fair	60-74	Thin overlay
Poor	41-59	Thick overlay
Very Poor	0-40	Reconstruction

* Not eligible for competitive funding program

Note that Table 2.2 does NOT preclude other treatments that a local agency may choose to select or use. Indeed, there have been many new pavement technologies and techniques introduced since 1998 that a local agency should consider for preventive maintenance, and which may be funded under the Measure M turnback program. ***The treatments in Table 2.2 are intended to identify the types of treatments that OCTA will fund under the competitive grant program only.***

2.4. QC/QA Plan

A quality control/quality assurance (QC/QA) plan must be prepared by all agencies. The purpose of the QC/QA plan is to ensure that all procedures used to collect distress data comply with OCTA's guidelines and result in the delivery of a quality data product. The QC/QA plan should also provide for corrective actions when deficiencies are encountered. As a minimum, the following components must be included:

a. Description of condition survey procedures (distress types, severities) or reference to the relevant documents in Section 3.1. All procedures, changes or modifications should be well documented in the QC/QA plan so that future updates will be consistent. In particular, unique situations are especially important and their documentation should be included.

b. How data will be collected (walking or windshield or combination of both).

c. Accuracy required for data collection.

d. Description of how data will be checked for accuracy by agency e.g. re-inspections.

e. Schedule for when data will be submitted.

f. Experience of inspectors including past training on condition surveys or calibration procedures.

g. Field data collection safety procedures.

Any findings that may compromise data integrity and consistency should be discussed and corrected. Examples of this include differences in survey methods from the last update (e.g. changing from windshield to walking surveys), collecting additional distress types and unique situations that may not lend themselves to existing condition survey procedures (e.g. gap-graded mixes, edge cracking with unpaved shoulders).

Prior to performing any work, local jurisdictions must review the QC/QA plan with inspection personnel.

A copy of the QC/QA plan must be submitted to OCTA together with the PMP certification.

2.5. Re-inspections

As part of any QC/QA process, it is essential to re-inspect portions of the network with different personnel than those performing the condition surveys. Re-inspections should be performed within one month of the original date of collection as pavement data will change with time, and during the winter, may change very rapidly.

The data to be re-inspected should include distress types, severities and quantities collected during the survey. At least 5% of the pavement sections should be re-inspected.

The selected sections for re-inspections should be representative of the local agency's network. This should include sections from:

- All functional classifications e.g. arterials, collectors and residentials/locals
- All surface types e.g. AC and PCC
- Entire range of pavement conditions e.g. good, fair, poor etc
- All significant changes in PCI i.e. sections with more than ±10 PCI points a year with no plausible explanations should be targeted for re-inspections.
- All inspectors
- Different geographical areas

Acceptability Criteria

In general, inspectors should identify distress types accurately 95% of the time. Linear measurements should be considered accurate when they are within ±10% if re-measured, and area measurements should be considered accurate when they are within ±20% if re-measured.

For the data to be acceptable, 90% of the re-inspected sections must be within ±10 PCI points.

If the results of the re-inspections do not meet the above criteria, all inspections should be immediately halted and any differences should be identified and discussed. Corrective actions should be taken immediately. The local jurisdiction should then perform reinspections of an *additional* 5% of the pavement sections.

2.6. Prequalification/Calibration of Inspectors

Prequalification or calibration of inspectors ensures that proper procedures are followed and that the results obtained are within acceptable variability ranges. This will be implemented by OCTA staff.

Briefly, the procedures to prequalify or calibrate inspectors are as follows:

a. OCTA must select at least 20 pavement sections to be used as control or test sites. Collectively, the control sites should exhibit common distress types and levels of severity that will be encountered in the pavement network and should be across all functional classes, pavement age, surface type, pavement condition and distresses.

b. Inspect the sections manually (walking survey) using at least two different experienced inspectors and the established survey protocols (Appendix B and ASTM D6433-09), including any modifications, if any. This will establish the baseline Pavement Condition Index (PCI) for each control section.

c. The candidate inspectors should then survey the same pavement sections within one month of the control surveys established in Step (b). The data for the 20 sections should be collected and submitted to OCTA as soon as they are completed.

d. Calculate the PCIs based on the survey data collected by inspectors.

e. Compare the control PCI data with survey results by candidate inspectors. Identify the differences and areas of consistency improvement.

Acceptability Criteria

The criteria for acceptability are:

a. At least 50% (or 10) of the sections must be within ±5 PCI points of the baseline PCIs.
b. No more than 10% (or 2) of the sections may be greater than ±15 PCI points from the baseline.

2.7. Pavement Management Software Training

At least one representative of the local jurisdiction must be familiar with the PMS software utilized, and have attended one training class. In the case of MicroPAVER, training classes are conducted regularly. The American Public Works Association (APWA) conducts hands-on MicroPAVER training classes for a fee, at least once a year, usually in Arizona (see www.apwa.net for more information). Web-based training programs on specific modules are also available for a fee and broadcast schedules are periodically posted on the APWA website.

The Metropolitan Transportation Commission (MTC) provides free training classes on their StreetSaver® software program as well as field condition surveys. Typically, two field training classes are conducted annually; one in Northern California and one in Southern California (see www.mtcpms.org for more information). There are enough similarities between StreetSaver's and MicroPAVER's condition surveys that this training class will benefit any inspector new to the process.

2.8. MicroPAVER Data Files

The MicroPAVER data files shall be submitted to OCTA in spreadsheet format. This must include the following information:

- Street name
- Street identifiers (Branch ID, Section ID)
- Direction (if applicable)
- Begin and end of section
- Length, widths and true areas
- Rank (arterial, collector, local etc)
- Number of travel lanes
- Pavement Condition Index (PCI) and date of inspection
- Type of recommended treatment

Further technical guidance will be provided by OCTA prior to the time of submittal.

Chapter 3. Agency Submittals

Local agencies must submit to OCTA the following as part of the biennial certification:

1. Pavement management program certification (see Appendix B).
2. QC/QA plan (see Section 2.4)
3. MicroPAVER data files in a form useable by OCTA (see Section 2.8)
4. Pavement management plan which includes the following:
    a. Average (weighted by area) PCI for:
        i. Entire pavement network
        ii. MPAH roadways
        iii. Local streets
    b. Projected PCI under existing funding levels over the next seven years for:
        i. Entire pavement network
        ii. MPAH roadways
        iii. Local streets
    c. Seven-year plan for road maintenance and rehabilitation, identifying street sections selected for treatment, based on the existing budget. Specific data to be submitted are:
        i. Street name
        ii. Limits of work
        iii. Lengths, widths and pavement areas
        iv. Functional classification
        v. PCI and most recent date of inspection
        vi. Type of treatment
        vii. Cost of treatment
        viii. Year of treatment
    d. Alternative funding levels required to:
        i. Maintain existing average network PCI
        ii. To improve average network PCI
5. In order to be eligible for the local match reduction of 10%, the following must be submitted:
    a. Measurable improvement of paved road conditions during the previous reporting period defined as an overall weighted (by area) average system improvement of one Pavement Condition Index (PCI) point.
    b. No reduction in the overall weighted (by area) average PCI in the Master Plan of Arterial Highways (MPAH) or local street categories;

- or –

c. Road pavement conditions during the previous reporting period within the highest twenty percent of the scale for road pavement conditions in accordance with OCTA Ordinance No. 3 (i.e. PCI ≥75).

APPENDIX A

Results of Survey Questionnaire

In order to capture the current pavement condition survey practices, NCE developed a survey questionnaire which contained questions ranging from the Pavement Management System (PMS) software used, pavement survey cycles, pavement distresses collected, QC/QA procedure, pavement treatment policies and unit costs.

The main questions in the questionnaire included:

1. Current PMS program i.e. what does the database contain?
2. Typical inspection cycles
3. Last pavement condition survey (when and by whom)
4. QC process for pavement condition survey
5. Survey methodology
6. Types of distresses collected
7. Pavement condition rating scale used
8. Triggers/thresholds for different maintenance treatments
9. Prioritization process used to select sections for treatment
10. Components used to calculate treatment unit costs
11. Pavement prediction models (deterioration curves)
12. Inventories for other assets maintained

The questionnaire was distributed by OCTA to all local agencies in June 2009. All 35 agencies responded to the Pavement Condition Survey Questionnaire, with the last response received on July 23, 2009. The results of the survey are summarized and discussed in the following paragraphs. A copy of the questionnaire is included as Exhibit A at the end of this appendix.

A.1. Pavement Management Systems

Table A.1 is a summary of Pavement Management System (PMS) programs currently used by local agencies in Orange County. The responses listed by the Bucknam survey in November 2007 are also included for comparison.

Comparing the data from both 2007 and 2009, it appears that two agencies (Laguna Woods and Laguna Niguel) have switched from MicroPAVER to another PMS. When NCE contacted the agencies for clarifications, they reported that they did not actually have MicroPAVER as their PMS in 2007. Laguna Woods will switch to MicroPAVER when requested by OCTA. Laguna Niguel has purchased the MicroPAVER software but has not implemented the PMS.

Of the 35 agencies in Orange County, 20 use MicroPAVER, which accounts for approximately 59% of road centerline miles in Orange County. Eleven (11) of the MicroPAVER users have their databases linked to GIS. The other 15 agencies use other PMS software, or have no PMS software. This is illustrated in Figures A.1 and A.2.

Table A.1: Pavement Management System (PMS) Programs

Pavement Management System	Number of Agencies		
	2007 Survey (Bucknam)	2009 Survey (NCE)	Database Linked to GIS
MicroPAVER	22	20	11
MTC/StreetSaver	5	5	0
Orange County PMS	3	4	1
Stantec	2	2	1
Cartegraph	1	1	0
IMS PavePro	1	1	1
Abbott & Associates	1	1	0
No PMS Software	0	1	0
Total	**35**	**35**	**14**

Figure A.1: Pavement Management System (PMS) Programs Used by Agencies (Breakdown by # of Agencies)

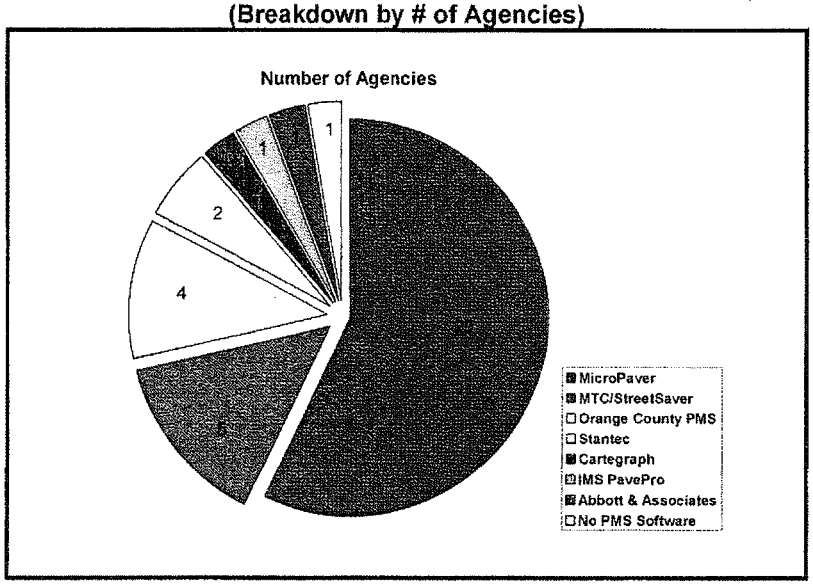
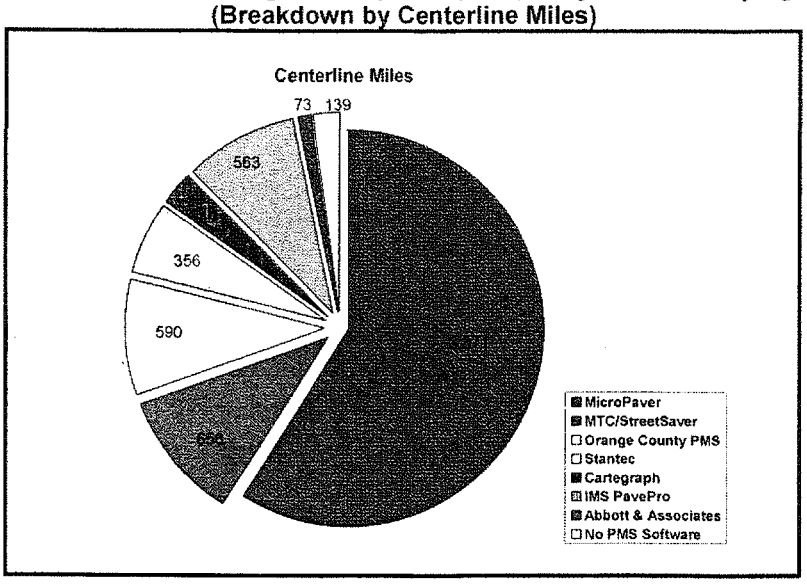


Figure A.2: Pavement Management System (PMS) Programs Used by Agencies (Breakdown by Centerline Miles)



There are several reasons why many agencies have not converted to MicroPAVER, despite the action taken by OCTA's Technical Advisory Committee in 2008. They include:

- Existing PMS software has more capabilities than MicroPAVER. One key factor is that the default performance curve in MicroPAVER is a straight line.
- Integration of existing PMS software with other applications precludes an easy conversion. The linkage to a GIS is a particularly critical application for many agencies.
- Cost of conversions, particularly if the pavement network is large.
- Lack of resources or skills to convert to MicroPAVER.

A.2. Data Components in Database

In their PMS, all the agencies have pavement condition data. Most of the agencies also have inventory, maintenance & rehabilitation decision tree, unit costs, performance prediction models, and prioritization information. A few of them have ride quality or deflection data in the databases as well.

The key conclusion we can draw from Table A.2 is that all the agencies are using a PMS to collect condition survey data, but 30% are NOT using it to assist them in making decisions in planning and programming. Since a PMS is intended primarily as a budgeting and planning tool, it would appear that this objective is not being met.

Table A.2: Data Components in Database

Data Component	Number of Agencies
Inventory	35*
Pavement condition	35
Maintenance history	25
Ride quality or deflection data	6
Maintenance & rehabilitation decision tree	24
Maintenance & rehabilitation unit costs	28
Performance prediction models	20
Prioritization	25

* Two agencies reported that they have pavement condition data but not inventory data, which is not possible.

A.3. Pavement Inspection Cycles

From the responses to the questionnaire, the average inspection cycles are:

Arterial roads - 2.3 years
Collector roads - 2.5 years
Residential roads - 3.2 years

Most agencies survey their arterial and collector roads more frequently than residential roads. However, Huntington Beach surveys the residential roads more frequently to accommodate their residential slurry seal programs. Laguna Niguel also reported that they survey the residential and collector roads more frequently than arterial roads.

Measure M requirements indicate that the PMP should be updated biennially. Other regional agencies have similar requirements; the Los Angeles Metropolitan Transportation Authority (Metro) requires that all pavements be surveyed triennially, and the Metropolitan Transportation Commission (San Francisco Bay Area) requires that arterials and collectors be surveyed every two years, and residential streets every five years.

Finally, most of the agencies (33) had their last pavement inspection in 2007-2008. Only two agencies had their last pavement inspection more than two years ago.

It can be concluded that the member jurisdictions are largely complying with Measure M's requirements.

A.4. Pavement Distresses Collected

There are two types of pavements, asphalt concrete (AC) and Portland cement concrete (PCC). The vast majority of local streets and roads in Orange County are AC, and this is

reflected in the survey results. Table A.3 shows all the AC distress types and number of agencies that collect them.

Table A.3: AC Pavement Distresses Collected in Orange County

No.	AC Distress	Number of Agencies Collecting Distress
1	Alligator Cracking (fatigue)*	33
2	Bleeding*	25
3	Block Cracking*	30
4	Bumps & Sags	25
5	Corrugation	23
6	Depression	30
7	Edge Cracking*	29
8	Joint Reflection Cracking	23
9	Lane/Shoulder Drop Off	20
10	Longitudinal/Transverse Cracking*	34
11	Patch/Utility Cut*	34
12	Polished Aggregate	18
13	Pothole	28
14	Railroad Crossing	19
15	Rutting*	34
16	Shoving	23
17	Slippage Cracking	20
18	Swell	18
19	Weathering and Raveling*	32

*These distresses are the minimum distresses recommended for collection in the 1997 report "*Orange County PMS Standardization Recommendations*".

Twenty-two agencies have no PCC pavements, or do not collect PCC distresses. The 13 agencies that survey the PCC pavements collect almost all 19 PCC distresses. Table A.4 shows all the PCC distress types and number of agencies that collect them. The distresses are defined in the MicroPAVER manuals (see Appendix C).

Almost all agencies comply with OCTA's 1997 guidelines, which recommended the types of distresses to collect.

Table A.4: PCC Pavement Distresses Collected in Orange County

No.	PCC Distress	Number of Agencies Collecting Distress
1	Blow up	13
2	Corner Break*	13
3	Divided Slab	13
4	Durability Cracking*	12
5	Faulting*	12
6	Joint Seal Damage*	13
7	Lane/Shoulder Drop-Off	12
8	Linear Cracking*	13
9	Large Patch/Utility Cut	13
10	Small Patch	12
11	Polished Aggregate	12
12	Popouts*	12
13	Pumping	12
14	Punchout	12
15	Railroad Crossing	11
16	Scaling/Crazing	13
17	Shrinkage Cracking*	12
18	Corner Spalling	13
19	Joint Spalling*	13

*These distresses are the minimum distresses recommended for collection in the 1997 report "Orange County PMS Standardization Recommendations".

A.5. Pavement Condition Survey Methods

About two-thirds of the agencies hire consultants to perform pavement inspections. Others use their own staff or Orange County's staff to inspect the pavements, as shown in Table A.5.

Table A.5: Types of Pavement Inspectors

Inspection Performed by	Number of Agencies
Consultant	24
In-house Staff	8
Other (Orange County staff)	3
Total	35

Table A.6 summaries the pavement condition survey methods that are currently used by agencies in Orange County. Although the MicroPAVER survey protocols (ASTM D6433-09)

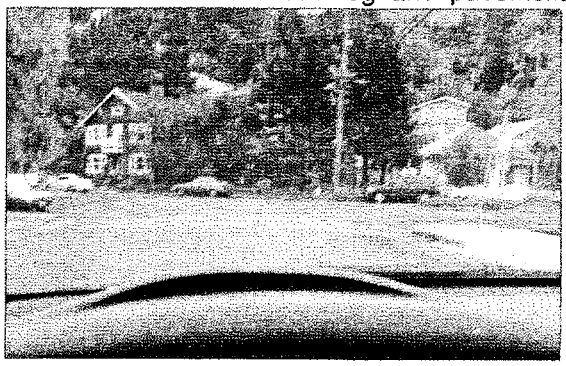
indicate that walking surveys are the standard, only 11 agencies are doing so. The remainder use windshield or automated surveys or a combination thereof.

Table A.6: Survey Methods Used by Agencies

Survey Method	Number of Agencies	Centerline Miles	% of Centerline Miles
Windshield	11	1,556	25%
Walking	11	1,678	27%
Windshield & Walking	9	1,779	29%
Automated	4	1,215	19%
Total	35	6,228	100%

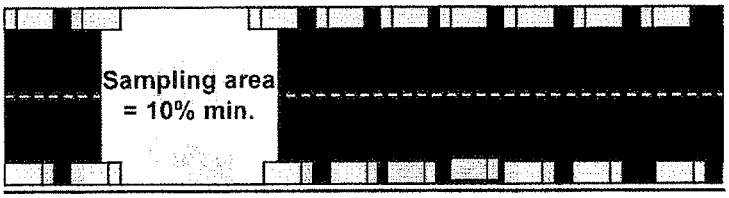
These three **types of distress surveys** comprise the spectrum of survey methods, and have been used in many agencies. Each has its advantages and disadvantages. Briefly, these are:

Windshield surveys are performed with crews in a vehicle traveling at low speeds. The major advantage is that 100% of the roadway is usually surveyed, and it can be accomplished very quickly, safely and inexpensively. However, the disadvantage is that the data collected tends to be of variable quality. In particular, low-severity distresses are typically not visible from a moving vehicle. This results in a higher than expected condition rating of the streets, and consequently, a lower estimate of the backlog and pavement maintenance and rehabilitation (M&R) needs. It is often used by small agencies with limited resources, or those with very good pavements with low traffic and that have little or no distress (e.g. new subdivisions).



Eleven agencies use windshield surveys, which accounts for 25% of the total centerline miles in Orange County.

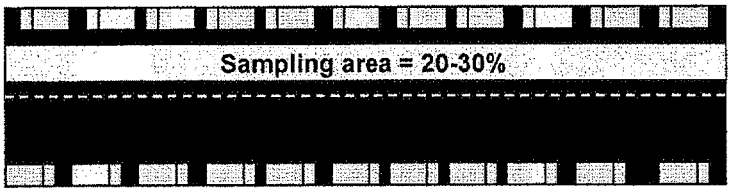
Walking surveys are performed with crews by walking on the pavement and measuring the distress quantities using a sampling method (see illustration below). The major advantage of this survey method is that it is highly accurate, since cracks and all other pavement distresses are measured and recorded. However, walking surveys are more labor-intensive and are thus more expensive than windshield surveys. This is the recommended protocol for MicroPAVER or StreetSaver type of surveys.



Eleven agencies use walking surveys, which accounts for 27% of the total centerline miles in Orange County.

Combination of windshield and walking surveys: This was mostly windshield surveys, supplemented with walking surveys when a closer look was needed. Nine agencies use a combination of windshield surveys and walking surveys, which accounts for 29% of the total centerline miles in Orange County.

Automated Surveys are typically performed with a customized vehicle that is equipped with a video or digital camera and/or laser bars. The major advantage is that they are equipped to perform surveys very quickly and safely. However, the quality of the data can be variable depending on light conditions (e.g. tree-lined streets with contrasts in light and dark) because shadows can mask some distresses. Typically, only the outer travel lanes are surveyed, and for most residential streets, only one lane is surveyed. These vehicles are expensive to purchase and agencies are therefore dependent on a vendor to provide this information.



Four (4) agencies use automated surveys, which accounts for 19% of the total centerline miles in Orange County. Typically, automated surveys were performed together with roughness (IRI) and deflection testing. Of four agencies, only one uses MicroPAVER. The other three use proprietary systems i.e. IMS PaverPro, Stantec and Cartegraph.

MicroPAVER is the selected system in Orange County and the standard protocol is windshield surveys. As can be seen from the table above, **24 agencies use windshield surveys or automated surveys, which accounts for 73% of the total centerline miles in Orange County. Therefore, it is critical to ensure that appropriate QC/QA procedures are in place.**

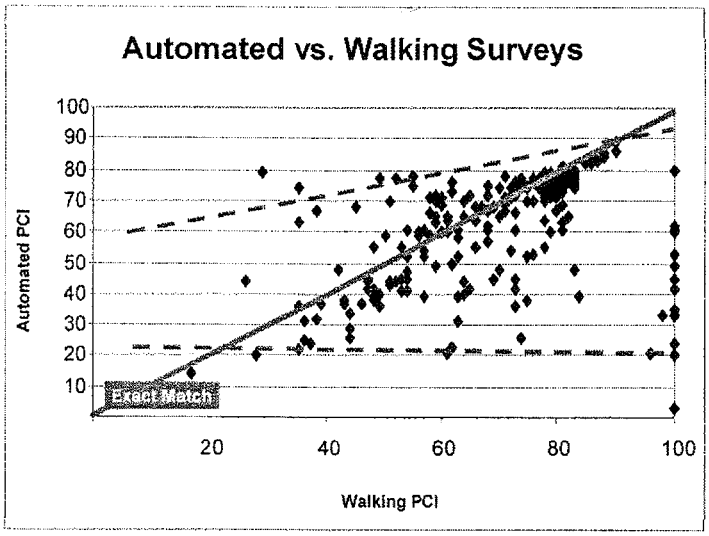
Few will dispute the variability and inaccuracy that is inherent in a windshield survey (using human eyes in a moving vehicle to determine cracks that are less than 3/8-inch wide is extremely challenging). However, the automated vehicles, with their video or digital images and laser bars are often perceived as highly accurate and precise. Unfortunately, this is not always the case.

Many agencies have performed studies to determine the accuracy and variability of automated survey methods. These studies have been mostly carried out by state highway agencies, e.g. Washington, Pennsylvania and Caltrans, to name just a few. However, these studies were performed on state highways, where conditions are significantly different from city/county streets and roads.

A more relevant study involving city streets was performed by MTC in 2007[5]. This study included four automated vendors who were contracted to survey two small cities. One was mostly residential, located in a hilly area, and with many trees shadowing the pavements. The other had more commercial and industrial areas, was in a relatively flat location, and had significantly more distress. The results received from the four vendors were compared to those from walking surveys. An example of the results is shown in Figure A.3, which compares the automated results with the walking surveys.

Each blue data point represents a pavement section. If there were an exact match between the automated and walking surveys, all the data points would line up on the green line. If the variability were very low, there would be tight band around the green line.

Figure A.3: Comparison of PCI Between Automated and Walking Surveys[3]

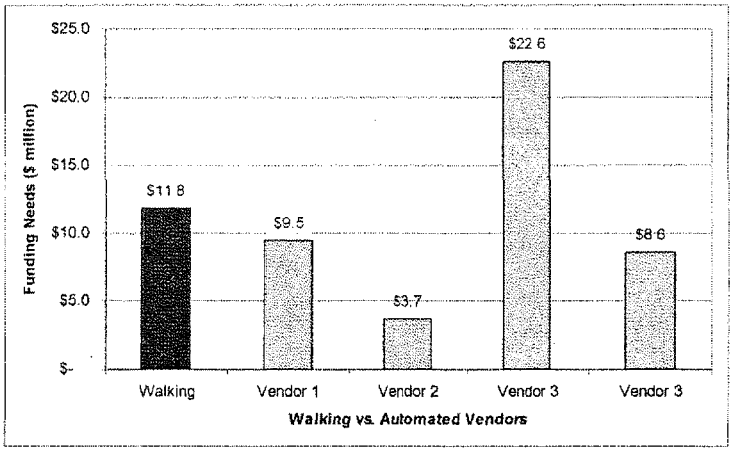


Instead, it is apparent that there is a very large variability in the data (represented by the red dashed lines). For example, pavements that are in good condition (i.e. pavement condition index of 100) had PCIs that ranged from 5 to 80!

[5] *The Impact of Semi-Automated Pavement Distress Collection Methods on Pavement Management Network Level Analysis for the Metropolitan Transportation Commission"*, by Roger E. Smith & Carlos Chang-Albitres, Texas A&M University, August 2007.

The variability has significant consequences in programming and funding decisions. Figure A.4 below shows the funding needs determined from the results of the four vendors. The red bar represents the needs from the walking surveys ($11.8 million); the blue bars show the large range in the funding needs from the four automated vendors i.e. $3.7 million to $22.6 million.

Figure A.4: Comparison of Funding Needs Between Automated and Walking Surveys[3]



Due to the variability that can exist with the different survey methods, it is therefore critical that agencies have in place a rigorous QC/QA program to ensure accuracy and consistency in the data obtained. Which leads us to the next question in our survey.

A.6. Quality Control/Quality Assurance

Quality Control (QC) is the responsibility of the person(s) performing the surveys, whether this is a consultant or in-house forces. Quality Assurance (QA) is the responsibility of the agency if a third party performs the surveys.

From the responses received, most agencies perform random check or re-inspections as part of their QC/QA measures. In addition, some agencies also reviewed survey procedures and performed calibrations as initial QA measures. However, eight (8) of the agencies do not have any QC/QA measures.

Of the four types of QC/QA activities described in Table A.7, the most effective is regular calibration of the inspectors prior to performing the surveys. Typically, an annual calibration is sufficient.

Table A.7: Pavement Inspection QC Performed by Agencies in Orange County

QC/QA	Number of Agencies*
Random Check/Re-inspections	25
Calibration	7
Survey Procedure Reviews	4
Other**	4
No QC	8

* Some agencies perform multiple QC items.
** Other QC measures include comparing data with the previous inspection, observing PCI trends, relating PCI to treatment histories, referencing to aerial imagery, etc.

A.7. Maintenance Treatment Thresholds

Pavement treatment thresholds are pavement condition levels in PCI that trigger pavement treatments. When the pavement condition falls below these thresholds, certain pavement treatments, such as surface seals, overlays or reconstructions, should be applied at the time.

The table below is a summary of pavement treatment thresholds currently employed by the agencies in Orange County. Although the average thresholds seem reasonable, note that a large variation exists among the agencies, as shown in Figure A.5.

Table A.8: Pavement Treatment Thresholds

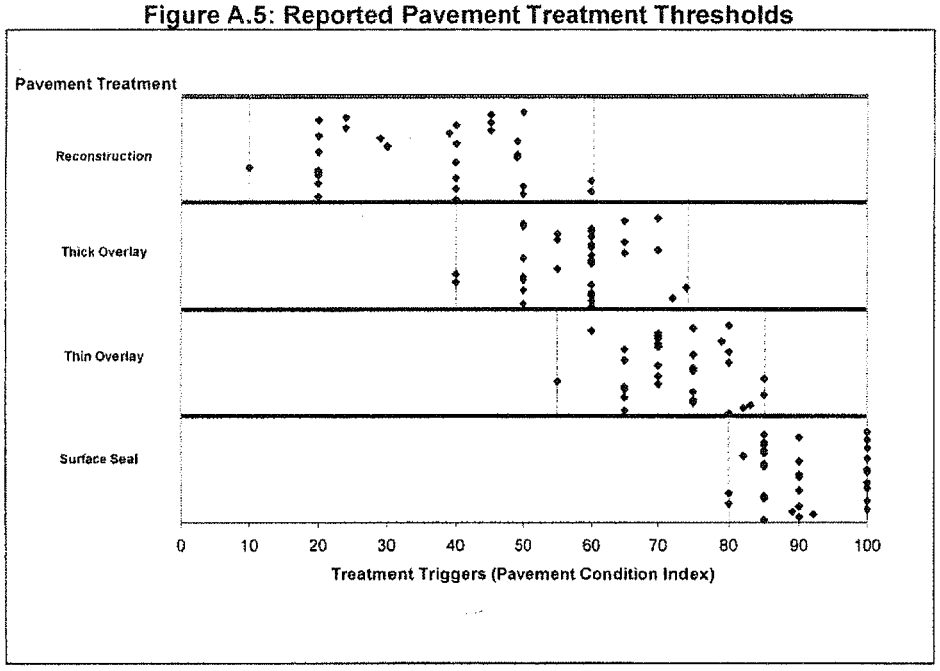
Pavement Treatment	Treatment Thresholds (in PCI)	
	Range	Average
Surface Seal	80 to100	91
Thin Overlay	55 to 85	73
Thick Overlay	40 to 74	58
Reconstruction	10 to 60	36

A.8. Pavement Treatment Prioritization

With limited budgets, only some of the pavements can be selected for treatments from long lists of street roads needing maintenance and rehabilitation. Agencies have to prioritize the work and ensure the roads that need improvements most be selected for the right treatments and at the right time.

From the agencies' responses to the questionnaire, the following are the strategies considered in prioritizing the pavement work:

Figure A.5: Reported Pavement Treatment Thresholds



Cost effectiveness
Long-term life-cycle cost effectiveness is one of the most important factors in the prioritization of the roads needing improvements and in the pavement treatment determination.

Functional Classifications
High priorities may be given to certain street functional classifications. For example, a factor may be applied to arterial roads to ensure they are selected first when the cost effectiveness is similar to that of other roads.

Utility Work Coordination
Utility cuts, like other patches, cause damage that reduces the level of service of the road. The coordination with utility work is essential in ensuring the best timing of the pavement treatment. Treating the pavement at the right time in relation to the utility work improves the cost effectiveness.

Maintenance Zones
Streets are prioritized by geographic maintenance zones so that all streets requiring maintenance within a particular area are addressed in the same year.

Complaints
The frequency of the complaints from the residents is factored in prioritizing the pavement treatments.

Worst First/Safety
The roads with the worst conditions are prioritized, especially when safety is a concern (potholes, severe irregularities, etc.)

Requirements Of Funding Sources
There are certain requirements that have to be met based on the funding sources. For example, Community Development Block Grant (DBG) funds do not allow slurry or cape improvements, and projects funded by federal Safe Routes to School (SRTS) Program must be within two miles of a grade school or a middle school.

Table A.9 summarizes the pavement prioritization strategies employed.

Table A.9: Pavement Treatment Prioritization Strategies

Prioritization Strategy	Number of Agencies
Cost effectiveness	20
Functional Classifications	5
Utility Work Coordination	1
Maintenance Zones	12
Complaints	2
Worst First (Safety)	2
Requirements of funding sources	4
Other	4

B.3. Pavement Deterioration Curves

Pavement deterioration curves are used to project the future pavement condition if the pavements are left untreated. Sequentially, the projected future condition is used to plan the treatment strategy and estimate the costs. Most of the PMS programs have default deterioration curves; for example, the MicroPAVER default performance curve is a straight line. Alternatively, customized curves can be developed from the agency's own pavement data. As shown in Table A.10, most of the agencies use the default curves provided by their PMS programs.

Table A.10: Pavement Deterioration Curves

Curve Type	Number of Agencies
Program Default Curve	25
Customized Curve	9
None (No PMS)	1

The default deterioration curves should be used only after the agency thoroughly understands them, and concurs that they are representative of the agency's network. If customized curves are to be developed, it is important that the agency have sufficient and

accurate data history of pavement conditions and pavement treatments for their development.

A.10. Pavement Treatment Unit Costs

Pavement treatment costs are usually expressed as a lump sum unit cost ($/square foot or $/square yard) in a PMP. To ensure consistency, it is essential that the agencies in Orange County include the same cost components in the unit cost. In the questionnaire, the agencies were asked if their pavement treatment unit costs included:

- Contractor's costs;
- Construction inspection/management;
- Engineering and design (PS&E); and
- Administrative and other costs

The survey results as shown in Table A.11 indicate that most agencies (26 out of 35) include all of the four components. However, four (4) agencies (Fullerton, La Palma, Laguna Niguel and Newport Beach) only use contractor's costs.

Table A.11: Summary of Components of Unit Costs

Components	Number of Agencies
Contractor's costs (e.g. asphalt, striping, etc)	35
Construction inspection/management	31
Engineering and design (PS&E)	29
Administrative and other costs	26
All four (4) components	26
Three (3) of the components	3
Two (2) of the components	2
One of the components Only (Contractor's costs)	4

For Countywide comparisons, all four components should be included i.e. contractor's costs, construction inspection, construction management, engineering & design, and administrative costs.

If agencies do not have sufficient data for some of the cost components, estimates can be made as percentages of the contractor's costs:

- Construction inspection/management - up to 15%
- Engineering and design (PS&E) - up to 25%
- Administrative and other costs - up to 10%

A.11. Other Assets

The last question in the questionnaire was whether the agency maintained inventories for assets other than the pavements. Most agencies maintain inventories of other assets, such as sidewalks, ADA facilities, drainage and traffic devices, as shown in Table A.12.

Table A.12: Inventory of Other Assets

Assets	Number of Agencies
Sidewalks	19
Drainages	26
ADA Ramps	15
Other*	13

* Sewers, water lines, wastewater infrastructure, streetlights, traffic control devices, traffic signs, tree wells, driveway approaches, etc.

Conclusions

Pavement condition data is the most fundamental component of a PMS. It is essential that the condition data be ***accurate, consistent and repeatable***. Obtaining accurate and consistent data requires rigorous Quality Assurance (QA) and Quality Control (QC) procedures during the pavement condition field surveys.

From the survey responses received, it is clear that all the agencies are collecting pavement condition data, although they may not have a PMS. Further, most are collecting, by and large, the standard distresses that were adopted by OCTA in 1998. Many are also collecting additional information for internal uses.

However, the differences between each agency are exposed when their procedures or protocols are examined closely. The majority (24 out of 35 agencies) hire consultants to perform pavement condition surveys. These surveys are accomplished in three primary methods i.e. walking surveys, windshield and automated. Each has its own source of variability and consistency may be achieved within each survey procedure. However, from the responses received, there is little to suggest that there is any consistency in the data obtained between these different methods unless they have been calibrated to a baseline. Since no baseline currently exists, it is almost certain that there are indeed inconsistencies if specific pavement sections were inspected across agencies.

Therefore, development of condition survey guidelines are a desirable and necessary objective. The guidelines described in Chapter 2 are based on the results of these surveys.

EXHIBIT A

Survey Questionnaire

Orange County Transportation Authority
Pavement Condition Survey Questionnaire (May 2009)

Agency: _____ **Date:** _____

First contact person:

Contact Name: _____ _____ Title: _____ Department/Division: _____

Address: _____ City: _____ Zip (5-digit): _____

Phone Number: _____ e-mail: _____

Second contact person (if applicable):

Contact Name: _____ _____ Title: _____ Department/Division: _____

Address: _____ City: _____ Zip (5-digit): _____

Phone Number: _____ e-mail: _____

Centerline Miles of Streets/Roads (update as needed)

Arterial/Collector _____ Residential/Local _____ Total Centerline Miles _____ (Calculated)

1. What Pavement Management System (PMS) Program (MicroPaver, MTC/ StreetSaver, Cartegraph, etc.) does your agency use? _____

2. How many years has the PMS program been in place? _____ Comments _____

3. What does your agency's PMS database include?

- ☐ Inventory
- ☐ Pavement condition
- ☐ Maintenance history
- ☐ Ride quality or deflection data
- ☐ Maint. & rehab. decision tree
- ☐ Maint. & rehab. unit costs
- ☐ Performance prediction models.
- ☐ Prioritization

4. Is the PMS database linked to a Geographic Information System (GIS)? _____

5. What is your typical inspection cycle in years? e.g. every 2 years for arterial and collector roads; 4 for residentail/local roads. Enter comments as needed.

Arterial Roads _____
Collector Roads _____
Residential/Local Roads _____
Comments _____

6. When was the most recent pavement inspection performed? Enter comments as needed.

Year (e.g. 2007) _____ Comments _____

7. Who performed the pavement inspections? In-house staff? Consultant? Others?

Comments

8. Describe in detail the QC process for the field inspection (e.g. calibration meetings, random checks, 5% re-inspection, none etc).

9. In the most recent field inspection, what type of methodology did your agency use?

Help ◯ Windshield Survey
Help ◯ Walking Survey
Help ◯ Automated Survey
◯ Other.

Describe your field inspection methodology below:

10. What pavement distresses do you collect? (If there are no PCC pavements within your agency, do not check any PCC distresses.)

Asphalt Concrete (AC)

Select all AC distresses | Deselect all AC distresses

- ☐ 1. Alligator Cracking (fatigue)
- ☐ 2. Bleeding
- ☐ 3. Block Cracking
- ☐ 4. Bumps & Sags
- ☐ 5. Corrugation
- ☐ 6. Depression
- ☐ 7. Edge Cracking
- ☐ 8. Joint Reflection Cracking
- ☐ 9. Lane/Shoulder Drop Off
- ☐ 10. Longitudinal/Transverse Cracking
- ☐ 11. Patch/Utility Cut
- ☐ 12. Polished Aggregate
- ☐ 13. Pothole
- ☐ 14. Railroad Crossing
- ☐ 15. Rutting
- ☐ 16. Shoving
- ☐ 17. Slippage Cracking
- ☐ 18. Swell
- ☐ 19. Weathering and Raveling

☐ Other. Explain below.

Portland Cement Concrete (PCC)

Select all PCC distresses | Deselect all PCC distresses

- ☐ 1. Blow up
- ☐ 2. Corner Break
- ☐ 3. Divided Slab
- ☐ 4. Durability Cracking
- ☐ 5. Faulting
- ☐ 6. Joint Seal Damage
- ☐ 7. Lane/Shoulder Drop-Off
- ☐ 8. Linear Cracking
- ☐ 9. Large Patch/Utility Cut
- ☐ 10. Small Patch
- ☐ 11. Polished Aggregate
- ☐ 12. Popouts
- ☐ 13. Pumping
- ☐ 14. Punchout
- ☐ 15. Railroad Crossing
- ☐ 16. Scaling/Crazing
- ☐ 17. Shrinkage Cracking
- ☐ 18. Corner Spalling
- ☐ 19. Joint Spalling

☐ Other. Explain below.

11. What pavement condition rating scale does your agency use? PCI? other? Indicate best/worst on scale.

Condition rated by:	Worst condition (e.g. 0, F, etc)	Best condition (e.g.100, A, etc)

12. What are the triggers or thresholds for different maintenance treatments?
e.g. if slurry is performed when PCI is between 70-85, enter "70-85" in "Seal" box.

Seal (e.g. slurry, cape etc)	Thin overlay	Thick overlay	Reconstruction

13. Describe the prioritization process used in selecting pavement sections to be treated.

14. What components are included in the pavement treatment unit costs?

- ☐ Contractor's costs (e.g. asphalt, striping, etc)
- ☐ Construction inspection/management
- ☐ Engineering and design (PS&E)
- ☐ Administrative and other costs

15. Describe the pavement condition prediction model (deterioration curves) your agency uses (e.g. program default curves, straight line deterioration, curves developed from your agency's own pavement deterioration histories, etc.).

16. Does your agency also maintain inventories for other assets (sidewalks, drainage, ADA ramps, etc.)?

- ☐ Sidewalks
- ☐ Drainage
- ☐ ADA ramps
- ☐ Other. Explain ->

Comments:

1. Please save your survey when completed using the Save button on the top.
2. Click on the "Submit by Email" button below to send. An automatic notification receipt will be sent to you. If you do not receive any notification email, please go to step 3. If your version of Adobe Reader does not support this feature, go to Step 3.
3. Send email to liqun@nce.reno.nv.us and attach this survey.
4. You can also print and fax this to Liqun Ke at (714) 848-2667.

Reset Form (clears all inputs!) Print Form Submit by Email

APPENDIX B

Pavement Management Program (PMP) Certification

Draft – 12/23/09

Date _____

RENEWED MEASURE M
LOCAL PAVEMENT MANAGEMENT PLAN CERTIFICATION

The City/County of _____certifies their Pavement Management Plan is in conformance with the criteria stated in the Orange County Local Transportation Authority Ordinance No.3. This ordinance requires that a Local Pavement Management Plan be in place and maintained to qualify for allocation of renewed Measure M net revenues.

The system was developed by _____* and contains, at a minimum, the following elements:

- Inventory of MPAH and local routes reviewed and updated biennially. The last update of the inventory was completed _____, _____.

- Assessment of pavement condition for all routes in the system, updated biennially. The last review of pavement condition was completed _____, _____.

- Percentage of all sections of pavement needing:
  Rehabilitation_____ Replacement_____

- Budget needs for rehabilitation or replacement of deficient sections of pavement for:
  Current biennial period_____ Following biennial period_____

- The local Pavement Management Plan is consistent with countywide pavement condition assessment standards as adopted by the Orange County Transportation Authority Board of Directors.

* A copy of the Local Pavement Management Plan must be submitted with the certification statement.

A copy of this certification is being provided to the Orange County Transportation Authority.

Submitted by:

_____
Local Jurisdiction

_____
Name (Print)

_____
Signed

_____
Title

Appendix C

PAVER Pavement Distress Identification Manuals for Asphalt Concrete and Portland Cement Concrete Pavements

Available Upon Request
from the
Clerk of the Board