

FINAL TECHNICAL MEMORANDUM #3

APPENDIX

Updated Correlation Tool

PRELIMINARY DRAFT

2007 Metro PCI Correlation Tool Instruction Sheet

Description

The Metro PCI Correlation Tool is a user-friendly spreadsheet that converts the 3R threshold of a jurisdiction's pavement condition index (PCI) to a normalized, countywide PCI (CPCI). This tool enables the Metro to calculate the estimated unmet backlog costs for 3R work on arterials and annual costs to maintain selected PCI threshold levels in the County of Los Angeles given knowledge of pavement management systems, PCI thresholds, and current local backlog and funding levels for arterials. This tool is only applicable to the jurisdictions of Los Angeles County and exclusively developed for Metro

This 2007 Version is an update from the original Metro PCI Correlation Tool developed in 2004. It incorporates the latest data from the 2007 System Preservation Survey. Two new Data Tabs were added in order to develop extrapolated unmet and annual costs and a new Cost Estimates Tab was added to calculate normalized County annual costs to maintain threshold.

PCI Correlator Tab

The PCI Correlator Tab is the main interface where most of the input data are located. The first column lists, in alphabetical order, all the jurisdictions in Los Angeles County that maintain streets with public access. For each jurisdiction, the user can select a pavement management system in the second column and enter a PCI threshold value for the selected system in the third column. These two columns are highlighted in yellow. It should be noted that users are only allowed to select from the list of available PMS systems.

Once data is entered, the Correlation Tool will automatically convert jurisdiction PCI threshold values to the Countywide PCI system and present the CPCI value in the fourth column. The formulas developed to convert jurisdiction PCI threshold values to Countywide PCI values are embedded into the Correlation Tool.

At the bottom of the table in the very last row is the average PCI threshold value for the entire County. This value is an average of the PCI thresholds for the County based on standardized PCIs from the local jurisdictions. Only correlatable systems are used to calculate the countywide average. (See below for additional description of correlatable systems.)

Normalized Cost Tabs

Normalized Unmet Costs

This Tab calculates normalized County unmet 3R backlog costs for arterials and based on a selected Countywide PCI threshold. The user can select a Countywide PCI

threshold from a drop down menu located at the top left corner of the Cost Estimates Tab. This Tab reads in the data from the PCI Correlator Tab and the Unmet Costs Data Tab to calculate the normalized costs at the selected CPCI threshold.

Normalized Annual Costs

This Tab calculates normalized County annual costs to maintain arterials at a PCI threshold selected in the Normalized Unmet Cost Tab. This Tab reads in the data from the PCI Correlator Tab and the Annual Costs Data Tab to calculate the normalized annual costs.

Data Tabs

Data - Correlation Curves

For the purposes of this Task Order the Metro adopted the US Army Corps of Engineers (USACE) PCI family of curves as the countywide PCI system due to the fact that it found to be the most commonly used basis for rating pavement conditions.

The PCI systems of all jurisdictions were evaluated with respect to their correlatability to the USACE system. For PCI systems that were deemed correlatable to the USACE system, a mathematical regression model was created to translate given threshold ratings to the USACE system. These regression models were developed by comparing specific data points representing similar pavement conditions from the non-USACE PCI system and from the USACE system.

Presented in this Data Tab are data points and mathematical curves for all PMS systems analyzed as part of this Task Order. PMS systems listed in this Data Tab were found to be in use by at least one Los Angeles County jurisdiction at the time of this Task Order.

Data - Surrogate PCI Thresholds

Where systems in use were found to be non-correlatable to the USACE system or where jurisdictions were found to have no PMS systems in place, a surrogate PCI threshold was developed using data from two donor jurisdictions with correlatable systems that have the following similar characteristics:

- General topographic conditions (flat, hilly)
- General soil conditions (alluvial plain, coastal, non-erodible)
- General traffic volumes (low, medium, high)
- General truck volumes (low, medium, high)

The numerical average of the correlatable PCI thresholds from the two donor jurisdictions is used to represent the PCI threshold value of the non-correlatable jurisdiction.

Data - Unmet Costs

This tab estimates extrapolated costs for jurisdictions that did not provide responses for 3R backlog costs and funding. Note that where backlog responses were reported to be less than funding responses, the backlog response was changed to match the funding response. The dataset is then fed into the Normalized Unmet Costs Tab to calculate normalized County unmet backlog costs.

Data - Annual Costs

This tab estimates extrapolated costs for jurisdictions that did not provide responses for annual costs to maintain PCI threshold. The dataset is then fed into the Normalized Annual Costs Tab to calculate normalized County annual cost to maintain threshold.

Spreadsheet Formats and Protection

Most areas in this Tool are read-only and password protected, except for two yellow-highlighted areas. One area is the Pavement Management System and the Provided PCI Threshold columns located in the PCI Correlator Tab. Another area is a yellowed cell located on the top left corner of the Normalized Unmet Costs Tab next to the cell labeled "Select CPCI Threshold". Clicking on this cell will give the user a drop down menu to pick the selected CPCI Threshold for calculating both the normalized County unmet backlog costs and the normalized County annual costs to maintain selected threshold. In these yellow-highlighted cells, the user is allowed to alter and save any entries and edits.

The password protection serves to permit users to select from the available pavement management systems and to prevent users from making unintentional calculations and edits.

Metro PCI Correlation Tool

Jurisdiction	Pavement Management Software	Provided PCI Threshold*	Normalized PCI Threshold
Agoura Hills	Micro PAVER	40	40
Alhambra	Micro PAVER	65	65
Arcadia	Micro PAVER	55	55
Artesia	Micro PAVER	80	80
Avalon	No PMS System	NS	62
Azusa	In House	20	78
Baldwin Park	LACDPW	65	80
Bell	Nichols Consulting Engineers	50	50
Bell Garden	Micro PAVER	55	55
Bellflower	Micro PAVER	70	70
Beverly Hills	Hansen's PMS	5.9	55
Bradbury	No PMS System	NS	78
Burbank	Micro PAVER	55	55
Calabasas	Micro PAVER	70	70
Carson	Micro PAVER	71	71
Cerritos	Infrastructure Management Services (IMS)	60	44
Claremont	In House	70	83
Commerce	In House	60	63
Compton	Micro PAVER	70	70
Covina	CHEC Infra Manager	75	75
Cudahy	Willdan PMS (0-100 scale)	50	57
Culver City	CHEC Infra Manager	50	50
Diamond Bar	Micro PAVER	70	70
Downey	Infrastructure Management Services (IMS)	79	69
Duarte	CarteGraph Pavementview Plus	80	80
El Monte	Pavement Condition Inventory	2	70
El Segundo	Micro PAVER	55	55
Gardena	MTC StreetSaver	90	90
Glendale	Micro PAVER	60	60
Glendora	No PMS System	NS	83
Hawaiian Gardens	Micro PAVER	40	40
Hawthorne	In House (based on Micro PAVER)	60	60
Hermosa Beach	Micro PAVER	55	55
Hidden Hills	No PMS System	NS	55
Huntington Park	CarteGraph Pavementview Plus	51	51
Industry	No PMS System	NS	63
Inglewood	Berryman & Henigar	65	74
Irwindale	LACDPW	70	62
La Canada Flintridge	Stantec MPMA	7	70
La Habra Heights	No PMS System	NS	58
La Mirada	LACDPW	3	63
La Puente	Micro PAVER	55	55
La Verne	CarteGraph Pavementview Plus	70	70
Lakewood	In House	70	80
Lancaster	In House	2.6	60
Lawndale	Micro PAVER	50	50
Lomita	CarteGraph Pavementview Plus	80	80
Long Beach	Micro PAVER	55	55
Los Angeles City	Micro PAVER	60	60
Los Angeles County Unincorporated	Stantec MPMA	7.4	74
Lynwood	In House	3	57

*Values are from 2007 Metro PCI survey; "NS" means not stated in survey response
October 2007

PCI Correlator - 4

Metro PCI Correlation Tool

Jurisdiction	Pavement Management Software	Provided PCI Threshold*	Normalized PCI Threshold
Malibu	MTC StreetSaver	50	50
Manhattan Beach	Stantec MPMA	5	50
Maywood	Micro PAVER	70	70
Monrovia	Pavement Condition Inventory	88	55
Montebello	Micro PAVER	55	55
Monterey Park	Berryman & Henigar	44	54
Norwalk	Micro PAVER	55	55
Palmdale	Micro PAVER	70	70
Palos Verdes Estates	Micro PAVER	85	85
Paramount	Micro PAVER	70	70
Pasadena	Modified Micro PAVER 1-70	30	43
Pico Rivera	Harris & Associates	NS	63
Pomona	CHEC Infra Manager	65	65
Rancho Palos Verdes	Micro PAVER	70	70
Redondo Beach	Stantec MPMA	7	70
Rolling Hills Estates	Willdan PMS (0-0.15 scale)	0.05	78
Rosemead	Micro PAVER	40	40
San Dimas	MTC StreetSaver	85	85
San Fernando	In House	65	61
San Gabriel	MTC StreetSaver	70	70
San Marino	MTC StreetSaver	50	50
Santa Clarita	MTC StreetSaver	54	54
Santa Fe Springs	Micro PAVER	70	70
Santa Monica	Micro PAVER	70	70
Sierra Madre	Micro PAVER	50	50
Signal Hill	Stantec MPMA	7	70
South El Monte	No PMS System	NS	57
South Gate	Micro PAVER	40	40
South Pasadena	In House	60	51
Temple City	MTC StreetSaver	68	68
Torrance	MTC StreetSaver	70	70
Vernon	MTC StreetSaver	69	69
Walnut	LACDPW	3	78
West Covina	MTC StreetSaver	70	70
West Hollywood	MTC StreetSaver	40	40
Westlake Village	No PMS System	NS	55
Whittier	Charles Abbot Assoc	70	45
Average Countywide PCI Threshold Value for 3R Work			62
Most Frequent Threshold Correlated to CPCI			70

*Values are from 2007 Metro PCI survey; "NS" means not stated in survey response
October 2007

PCI Correlator - 5

Normalized Unmet Arterial 3R Backlog Costs

Select CPCI Threshold 62 - CPCI Avg (Click cell to get drop down menu)

Jurisdiction	PMS System	Provided PCI Threshold	Normalized PCI Threshold	% Difference to Selected CPCI	Unmet Cost Data	Normalized Unmet Costs
Agoura Hills	Micro PAVER	40	40	54%	\$7,940,530	\$12,245,728
Alhambra	Micro PAVER	65	65	-5%	\$6,000,000	\$5,694,204
Arcadia	Micro PAVER	55	55	12%	\$5,718,288	\$6,413,550
Artesia	Micro PAVER	80	80	-23%	\$3,300,000	\$2,544,597
Avalon	No PMS System	NS	62	0%	\$271,955	\$271,955
Azusa	In House	20	78	-21%	\$8,000,000	\$6,326,893
Baldwin Park	LACDPW	65	80	-23%	\$6,800,000	\$5,243,413
Bell	Nichols Consulting Engineers	50	50	23%	\$300,000	\$370,123
Bell Garden	Micro PAVER	55	55	12%	\$1,000,000	\$1,121,586
Bellflower	Micro PAVER	70	70	-12%	\$23,730,000	\$20,911,964
Beverly Hills	Hansen's PMS	5.9	55	12%	\$9,500,000	\$10,655,063
Bradbury	No PMS System	NS	78	-21%	\$145,043	\$114,709
Burbank	Micro PAVER	55	55	12%	\$36,811,900	\$41,287,698
Calabasas	Micro PAVER	70	70	-12%	\$3,716,723	\$3,275,347
Carson	Micro PAVER	71	71	-13%	\$1,500,000	\$1,303,251
Cerritos	Infrastructure Management	60	44	39%	\$2,800,000	\$3,904,157
Claremont	In House	70	83	-26%	\$1,054,012	\$783,362
Commerce	In House	60	63	-2%	\$1,600,000	\$1,566,659
Compton	Micro PAVER	70	70	-12%	\$0	\$0
Covina	CHEC Infra Manager	75	75	-18%	\$7,600,000	\$6,250,971
Cudahy	Willdan PMS (0-100 scale)	50	57	8%	\$750,000	\$811,674
Culver City	CHEC Infra Manager	50	50	23%	\$16,145,034	\$19,918,842
Diamond Bar	Micro PAVER	70	70	-12%	\$244,000	\$215,024
Downey	Infrastructure Management	79	69	-11%	\$2,876,800	\$2,565,974
Duarte	CarteGraph Pavementview Plus	80	80	-23%	\$1,500,000	\$1,156,635
El Monte	Pavement Condition Inventory	2.0	70	-12%	\$1,325,000	\$1,167,651
El Segundo	Micro PAVER	55	55	12%	\$17,250,000	\$19,347,352
Gardena	MTC StreetSaver	90	90	-31%	\$1,315,000	\$901,319
Glendale	Micro PAVER	60	60	3%	\$0	\$0
Glendora	No PMS System	NS	83	-26%	\$7,922,966	\$5,888,502
Hawaiian Gardens	Micro PAVER	40	40	54%	\$250,000	\$385,545
Hawthorne	In House (based on Micro PAVER)	60	60	3%	\$3,300,000	\$3,392,796
Hermosa Beach	Micro PAVER	55	55	12%	\$637,760	\$715,302
Hidden Hills	No PMS System	NS	55	12%	\$45,326	\$50,837
Huntington Park	CarteGraph Pavementview Plus	51	51	21%	\$1,195,000	\$1,445,416
Industry	No PMS System	NS	63	-2%	\$9,530,900	\$9,332,296
Inglewood	Berryman & Henigar	65	74	-17%	\$20,000,000	\$16,595,855
Irwindale	LACDPW	70	62	0%	\$5,000,000	\$4,979,671
La Canada Flintridge	Stantec MPMA	7.0	70	-12%	\$0	\$0
La Habra Heights	No PMS System	NS	58	6%	\$1,858,362	\$1,976,502
La Mirada	LACDPW	3.0	63	-2%	\$6,269,894	\$6,139,242
La Puente	Micro PAVER	55	55	12%	\$7,700,000	\$8,636,209

Normalized Unmet Arterial 3R Backlog Costs

Select CPCI Threshold 62 - CPCI Avg (Click cell to get drop down menu)

Jurisdiction	PMS System	Provided PCI Threshold	Normalized PCI Threshold	% Difference to Selected CPCI	Unmet Cost Data	Normalized Unmet Costs
La Verne	CarteGraph Pavementview Plus	70	70	-12%	\$6,800,000	\$5,992,472
Lakewood	In House	70	80	-23%	\$5,600,000	\$4,318,105
Lancaster	In House	2.6	60	3%	\$15,765,000	\$16,208,314
Lawndale	Micro PAVER	50	50	23%	\$800,000	\$986,995
Lomita	CarteGraph Pavementview Plus	80	80	-23%	\$526,000	\$405,593
Long Beach	Micro PAVER	55	55	12%	\$66,600,000	\$74,697,602
Los Angeles City	Micro PAVER	60	60	3%	\$295,500,000	\$303,809,504
Los Angeles County Unincorporated	Stantec MPMA	7.4	74	-17%	\$221,000,000	\$184,228,016
Lynwood	In House	3.0	57	8%	\$4,600,000	\$4,978,266
Malibu	MTC StreetSaver	50	50	23%	\$810,000	\$999,333
Manhattan Beach	Stantec MPMA	5.0	50	23%	\$1,300,000	\$1,603,867
Maywood	Micro PAVER	70	70	-12%	\$3,200,000	\$2,819,987
Monrovia	Pavement Condition Inventory	88	55	12%	\$4,300,000	\$4,822,818
Montebello	Micro PAVER	55	55	12%	\$16,655,412	\$18,680,471
Monterey Park	Berryman & Henigar	44	54	14%	\$18,630,000	\$21,202,147
Norwalk	Micro PAVER	55	55	12%	\$8,000,000	\$8,972,685
Palmdale	Micro PAVER	70	70	-12%	\$5,800,000	\$5,111,226
Palos Verdes Estates	Micro PAVER	85	85	-27%	\$0	\$0
Paramount	Micro PAVER	70	70	-12%	\$1,779,000	\$1,567,736
Pasadena	Modified Micro PAVER 1-70	30	43	44%	\$7,700,000	\$11,083,135
Pico Rivera	Harris & Associates	NS	63	-2%	\$800,000	\$783,330
Pomona	CHEC Infra Manager	65	65	-5%	\$41,436,000	\$39,324,172
Rancho Palos Verdes	Micro PAVER	70	70	-12%	\$3,500,000	\$3,084,360
Redondo Beach	Stantec MPMA	7.0	70	-12%	\$6,100,000	\$5,375,600
Rolling Hills Estates	Micro PAVER	0.05	78	-21%	\$1,400,000	\$1,107,206
Rosemead	Micro PAVER	40	40	54%	\$4,100,000	\$6,322,939
San Dimas	MTC StreetSaver	85	85	-27%	\$32,935,000	\$23,901,979
San Fernando	In House	65	61	1%	\$2,123,005	\$2,146,922
San Gabriel	MTC StreetSaver	70	70	-12%	\$4,600,000	\$4,053,731
San Marino	MTC StreetSaver	50	50	23%	\$1,300,000	\$1,603,867
Santa Clarita	MTC StreetSaver	54	54	14%	\$23,344,637	\$26,667,880
Santa Fe Springs	Micro PAVER	70	70	-12%	\$6,481,602	\$5,711,885
Santa Monica	Micro PAVER	70	70	-12%	\$0	\$0
Sierra Madre	Micro PAVER	50	50	23%	\$0	\$0
Signal Hill	Stantec MPMA	7.0	70	-12%	\$0	\$0
South El Monte	No PMS System	NS	57	8%	\$0	\$0
South Gate	Micro PAVER	40	40	54%	\$52,500,000	\$80,964,462
South Pasadena	In House	60	51	21%	\$950,000	\$1,149,075
Temple City	MTC StreetSaver	68	68	-9%	\$900,000	\$816,448
Torrance	MTC StreetSaver	70	70	-12%	\$39,000,000	\$34,368,588
Vernon	MTC StreetSaver	69	69	-11%	\$9,660,000	\$8,636,209
Walnut	LACDPW	3.0	78	-21%	\$2,057,000	\$1,626,802
West Covina	MTC StreetSaver	70	70	-12%	\$4,385,000	\$3,864,263
West Hollywood	MTC StreetSaver	40	40	54%	\$6,110,000	\$9,422,721

Normalized Unmet Arterial 3R Backlog Costs

Select CPCI Threshold 62 - CPCI Avg (Click cell to get drop down menu)

Jurisdiction	PMS System	Provided PCI Threshold	Normalized PCI Threshold	% Difference to Selected CPCI	Unmet Cost Data	Normalized Unmet Costs
Westlake Village	No PMS System	NS	55	12%	\$305,000	\$342,084
Whittier	Charles Abbot Assoc	70	45	36%	\$4,800,000	\$6,513,631
Grand Totals					\$1,167,057,149	\$1,176,184,301

Normalized Annual Costs to Maintain Arterials

Selected CPCI Threshold 62 - CPCI Avg

Jurisdiction	PMS System	Provided PCI Threshold	Normalized PCI Threshold	% Difference to Selected CPCI	Annual Cost Data	Normalized Annual Cost
Agoura Hills	Micro PAVER	40	40	54%	\$558,278	\$860,966
Alhambra	Micro PAVER	65	65	-5%	\$1,000,000	\$949,034
Arcadia	Micro PAVER	55	55	12%	\$750,000	\$841,189
Artesia	Micro PAVER	80	80	-23%	\$200,000	\$154,218
Avalon	No PMS System	NS	62	0%	\$49,846	\$49,846
Azusa	In House	20	78	-21%	\$798,703	\$631,664
Baldwin Park	LACDPW	65	80	-23%	\$690,000	\$532,052
Bell	Nichols Consulting Engineers	50	50	23%	\$76,000	\$93,765
Bell Garden	Micro PAVER	55	55	12%	\$2,200,000	\$2,467,488
Bellflower	Micro PAVER	70	70	-12%	\$1,500,000	\$1,321,869
Beverly Hills	Hansen's PMS	5.9	55	12%	\$1,000,000	\$1,121,586
Bradbury	No PMS System	NS	78	-21%	\$26,585	\$21,025
Burbank	Micro PAVER	55	55	12%	\$14,545,000	\$16,313,463
Calabasas	Micro PAVER	70	70	-12%	\$681,232	\$600,333
Carson	Micro PAVER	71	71	-13%	\$2,200,000	\$1,911,435
Cerritos	Infrastructure Management	60	44	39%	\$2,000,000	\$2,788,683
Claremont	In House	70	83	-26%	\$590,816	\$439,106
Commerce	In House	60	63	-2%	\$1,000,000	\$979,162
Compton	Micro PAVER	70	70	-12%	\$3,000,000	\$2,643,738
Covina	CHEC Infra Manager	75	75	-18%	\$2,700,000	\$2,220,740
Cudahy	Willdan PMS (0-100 scale)	50	57	8%	\$275,000	\$297,614
Culver City	CHEC Infra Manager	50	50	23%	\$2,200,000	\$2,714,237
Diamond Bar	Micro PAVER	70	70	-12%	\$850,000	\$749,059
Downey	Infrastructure Management	79	69	-11%	\$750,000	\$668,966
Duarte	CarteGraph Pavementview Plus	80	80	-23%	\$300,000	\$231,327
El Monte	Pavement Condition Inventory	2.0	70	-12%	\$1,509,345	\$1,330,104
El Segundo	Micro PAVER	55	55	12%	\$800,000	\$897,268
Gardena	MTC StreetSaver	90	90	-31%	\$1,400,000	\$959,579
Glendale	Micro PAVER	60	60	3%	\$8,930,000	\$9,181,113
Glendora	No PMS System	NS	83	-26%	\$1,452,188	\$1,079,294
Hawaiian Gardens	Micro PAVER	40	40	54%	\$90,000	\$138,796
Hawthorne	In House (based on Micro PAVER)	60	60	3%	\$1,000,000	\$1,028,120
Hermosa Beach	Micro PAVER	55	55	12%	\$637,760	\$715,302
Hidden Hills	No PMS System	NS	55	12%	\$8,308	\$9,318
Huntington Park	CarteGraph Pavementview Plus	51	51	21%	\$65,000	\$78,621
Industry	No PMS System	NS	63	-2%	\$300,000	\$293,749
Inglewood	Berryman & Henigar	65	74	-17%	\$1,000,000	\$829,793
Irwindale	LACDPW	70	62	0%	\$200,000	\$199,187
La Canada Flintridge	Stantec MPMA	7.0	70	-12%	\$500,000	\$440,623
La Habra Heights	No PMS System	NS	58	6%	\$340,616	\$362,270
La Mirada	LACDPW	3.0	63	-2%	\$1,080,002	\$1,057,497
La Puente	Micro PAVER	55	55	12%	\$2,100,000	\$2,355,330

Normalized Annual Costs to Maintain Arterials

Selected CPCI Threshold	62 - CPCI Avg
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Jurisdiction	PMS System	Provided PCI Threshold	Normalized PCI Threshold	% Difference to Selected CPCI	Annual Cost Data	Normalized Annual Cost
La Verne	CarteGraph Pavementview Plus	70	70	-12%	\$1,000,000	\$881,246
Lakewood	In House	70	80	-23%	\$2,800,000	\$2,159,052
Lancaster	In House	2.6	60	3%	\$4,000,000	\$4,112,481
Lawndale	Micro PAVER	50	50	23%	\$500,000	\$616,872
Lomita	CarteGraph Pavementview Plus	80	80	-23%	\$100,000	\$77,109
Long Beach	Micro PAVER	55	55	12%	\$8,000,000	\$8,972,685
Los Angeles City	Micro PAVER	60	60	3%	\$37,600,000	\$38,657,318
Los Angeles County Unincorporated	Stantec MPMA	7.4	74	-17%	\$29,000,000	\$24,174,717
Lynwood	In House	3.0	57	8%	\$500,000	\$541,116
Malibu	MTC StreetSaver	50	50	23%	\$50,000	\$61,687
Manhattan Beach	Stantec MPMA	5.0	50	23%	\$1,096,618	\$1,352,946
Maywood	Micro PAVER	70	70	-12%	\$3,200,000	\$2,819,987
Monrovia	Pavement Condition Inventory	88	55	12%	\$750,000	\$841,189
Montebello	Micro PAVER	55	55	12%	\$17,364,161	\$19,475,393
Monterey Park	Berryman & Henigar	44	54	14%	\$3,100,000	\$3,528,001
Norwalk	Micro PAVER	55	55	12%	\$800,000	\$897,268
Palmdale	Micro PAVER	70	70	-12%	\$2,500,000	\$2,203,115
Palos Verdes Estates	Micro PAVER	85	85	-27%	\$623,078	\$452,188
Paramount	Micro PAVER	70	70	-12%	\$385,000	\$339,280
Pasadena	Modified Micro PAVER 1-70	30	43	44%	\$2,200,000	\$3,166,610
Pico Rivera	Harris & Associates	NS	63	-2%	\$1,000,000	\$979,162
Pomona	CHEC Infra Manager	65	65	-5%	\$4,500,000	\$4,270,653
Rancho Palos Verdes	Micro PAVER	70	70	-12%	\$500,000	\$440,623
Redondo Beach	Stantec MPMA	7.0	70	-12%	\$1,400,000	\$1,233,744
Rolling Hills Estates	Micro PAVER	0.05	78	-21%	\$320,000	\$253,076
Rosemead	Micro PAVER	40	40	54%	\$490,000	\$755,668
San Dimas	MTC StreetSaver	85	85	-27%	\$500,000	\$362,866
San Fernando	In House	65	61	1%	\$300,000	\$303,380
San Gabriel	MTC StreetSaver	70	70	-12%	\$900,000	\$793,121
San Marino	MTC StreetSaver	50	50	23%	\$70,000	\$86,362
Santa Clarita	MTC StreetSaver	54	54	14%	\$3,156,930	\$3,606,337
Santa Fe Springs	Micro PAVER	70	70	-12%	\$3,000,000	\$2,643,738
Santa Monica	Micro PAVER	70	70	-12%	\$4,900,000	\$4,318,105
Sierra Madre	Micro PAVER	50	50	23%	\$150,000	\$185,062
Signal Hill	Stantec MPMA	7.0	70	-12%	\$772,499	\$680,762
South El Monte	No PMS System	NS	57	8%	\$1,262,772	\$1,366,612
South Gate	Micro PAVER	40	40	54%	\$450,000	\$693,981
South Pasadena	In House	60	51	21%	\$200,000	\$241,911
Temple City	MTC StreetSaver	68	68	-9%	\$70,000	\$63,502
Torrance	MTC StreetSaver	70	70	-12%	\$5,000,000	\$4,406,229
Vernon	MTC StreetSaver	69	69	-11%	\$3,000,000	\$2,682,053
Walnut	LACDPW	3.0	78	-21%	\$100,000	\$79,086
West Covina	MTC StreetSaver	70	70	-12%	\$100,000	\$88,125
West Hollywood	MTC StreetSaver	40	40	54%	\$1,750,000	\$2,698,815

Normalized Annual Costs to Maintain Arterials

Selected CPCI Threshold	62 - CPCI Avg
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Jurisdiction	PMS System	Provided PCI Threshold	Normalized PCI Threshold	% Difference to Selected CPCI	Annual Cost Data	Normalized Annual Cost
Westlake Village	No PMS System	NS	55	12%	\$600,000	\$672,951
Whittier	Charles Abbot Assoc	70	45	36%	\$2,492,313	\$3,382,085
Grand Totals					\$213,908,051	\$215,176,792

PMS System: Infrastructure Management Services (IMS)

Typical Decision Tree for Army Corps

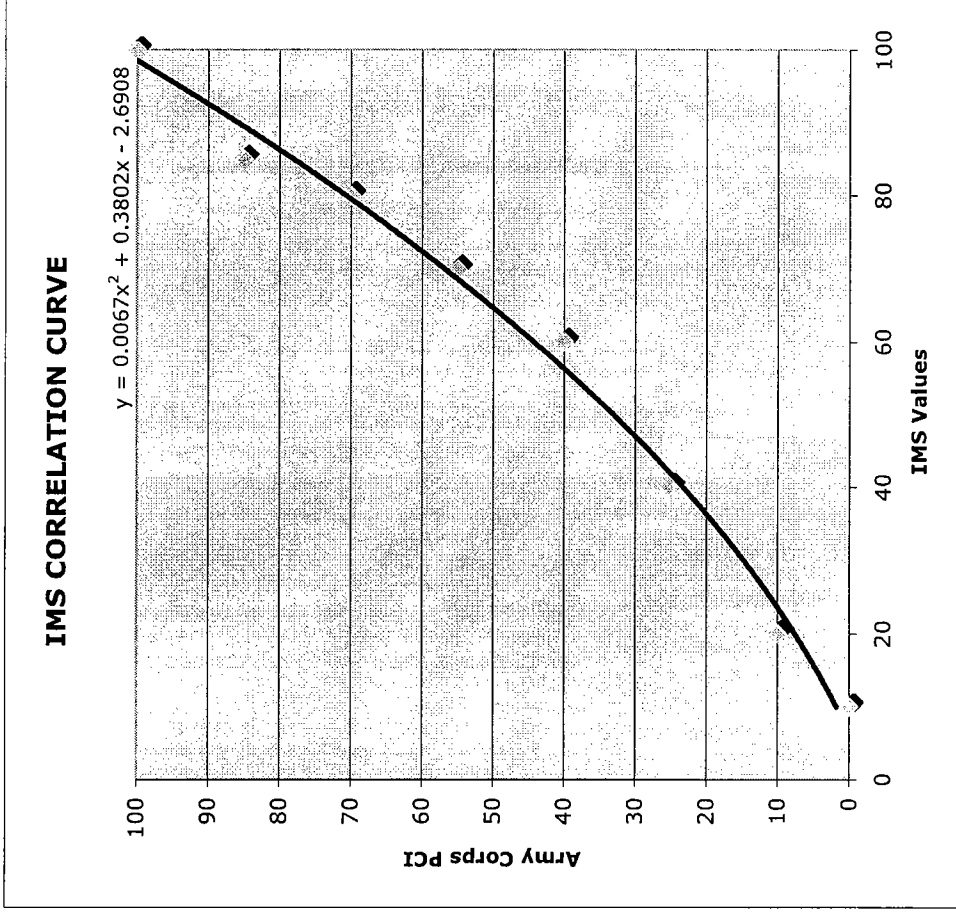
- 100-85 Excellent
- 84-70 Very Good
- 69-55 Good
- 54-40 Fair
- 39-25 Poor
- 24-10 Very Poor
- 9-0 Failed

Typical Decision Tree for IMS

- 100-85 Excellent Crack Seal
- 84-80 Very Good Slurry Seal
- 79-70 Good Thin Overlay
- 69-60 Fair Thick Overlay
- 59-40 Poor Surface Replacement
- 39-10 Very Poor Total Reconstruction

IMS	ACOE
10	0
20	10
40	25
60	40
70	55
80	70
85	85
100	100

IMS is on a scale from 10-100 instead of 0-100

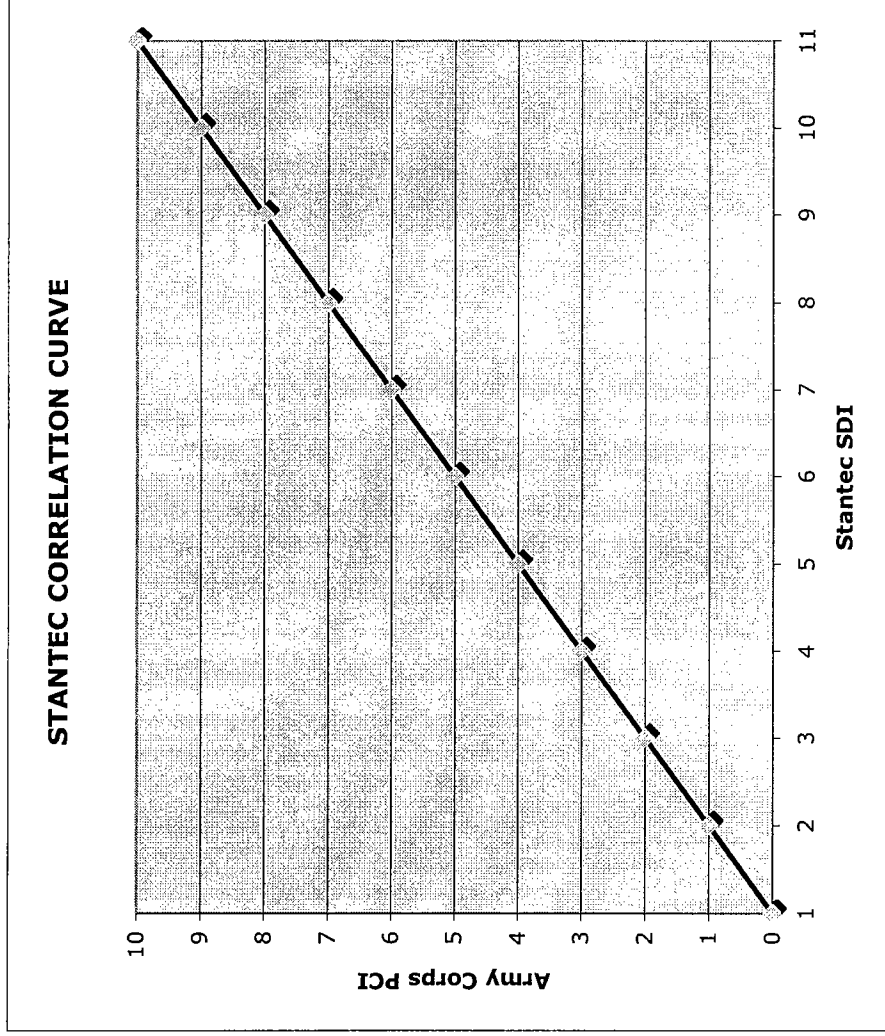


Metro PCI Correlation Curves

PMS System: STANTEC

Use SDI value - not the PQI - and multiply by 10 to get a value comparable to the Army Corps PCI.

Stantec	ACOE
0	0
1	10
2	20
3	30
4	40
5	50
6	60
7	70
8	80
9	90
10	100

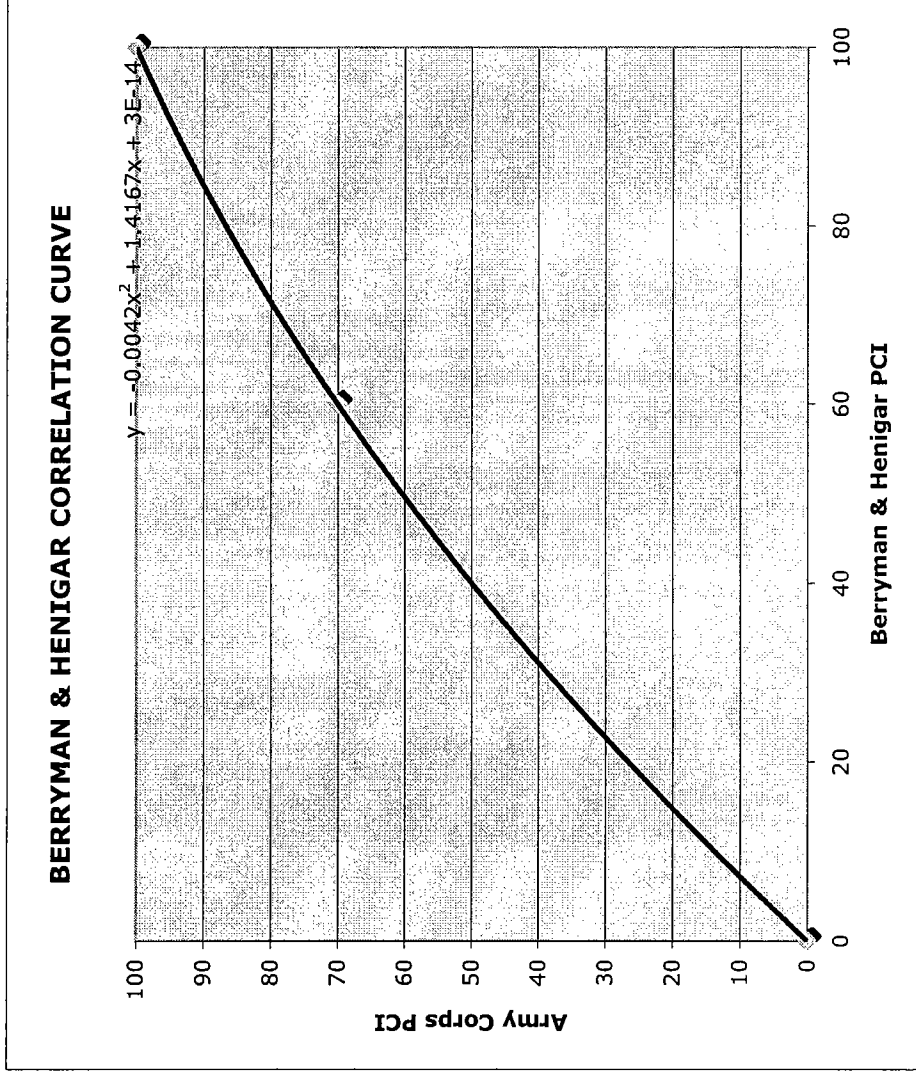


Metro PCI Correlation Curves

PMS System: BERRYMAN & HENIGAR

Berryman & Henigar's system provides a PCI value from 0-100 with 60 being the threshold for 3R work.

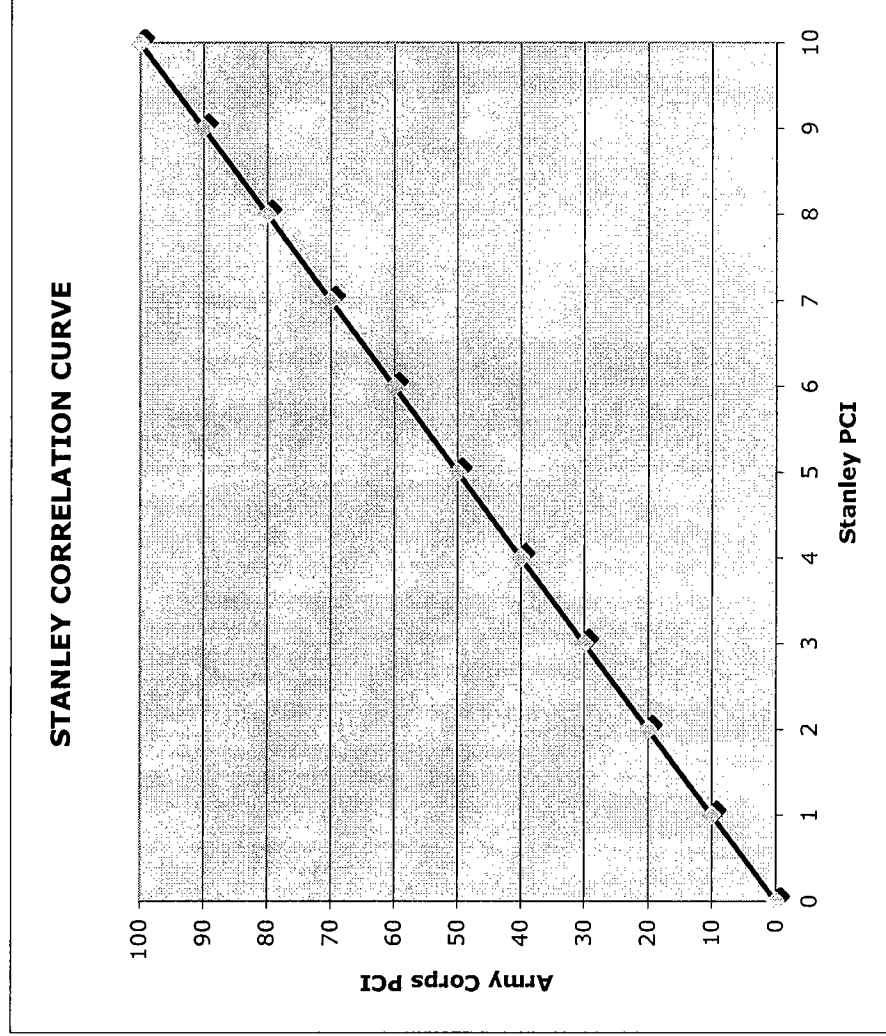
B&H	ACOE
0	0
60	70
100	100



PMS System: ITX STANLEY

Stanley's system provides a PCI value from 0-10 with 7 being the threshold for 3R work. This essentially correlates to the Army Corps if you multiply by a factor of 10.

Stanley	ACOE
0	0
1	10
2	20
3	30
4	40
5	50
6	60
7	70
8	80
9	90
10	100

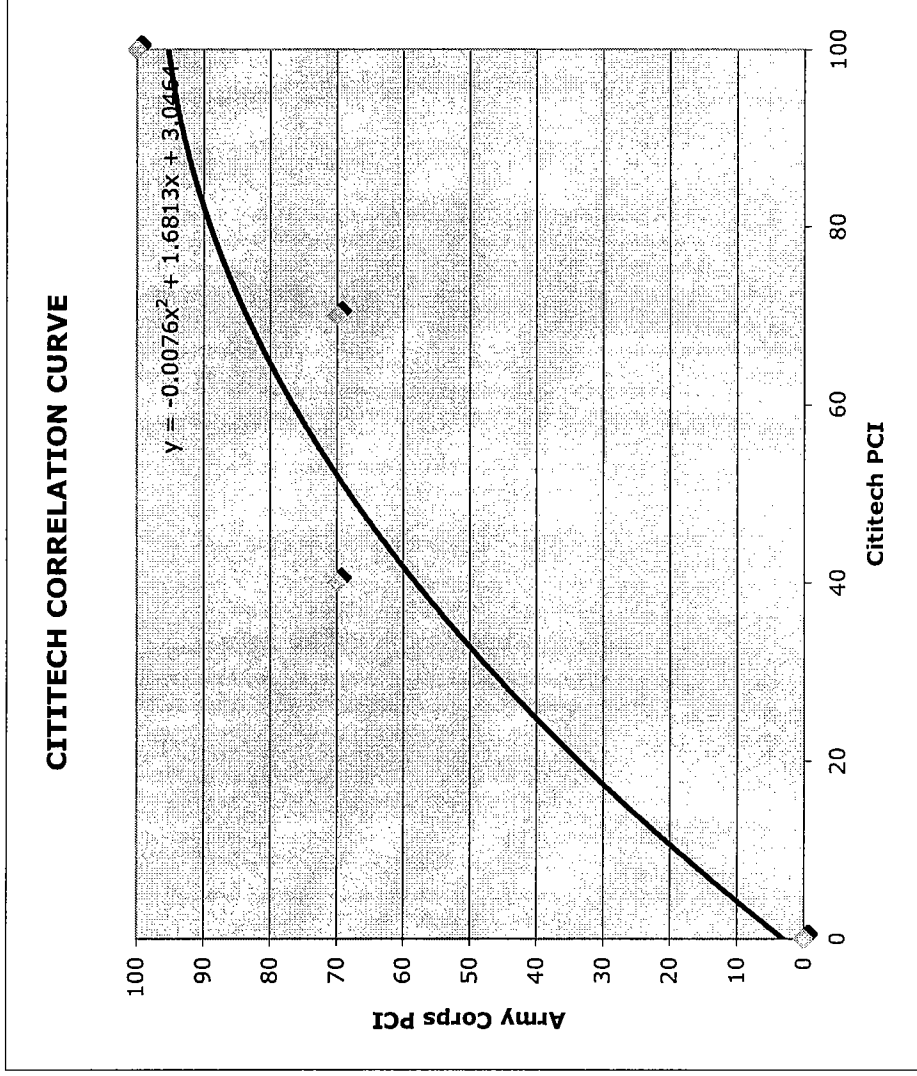


Metro PCI Correlation Curves

PMS System: CITITECH

Cititech's system provides a PCI value from 0-100. Palmdale is the only jurisdiction using this system. They report that they review any segments with a PCI value between 40 and 70 for 3R work.

Cititech	ACOE
0	0
40	70
70	70
100	100

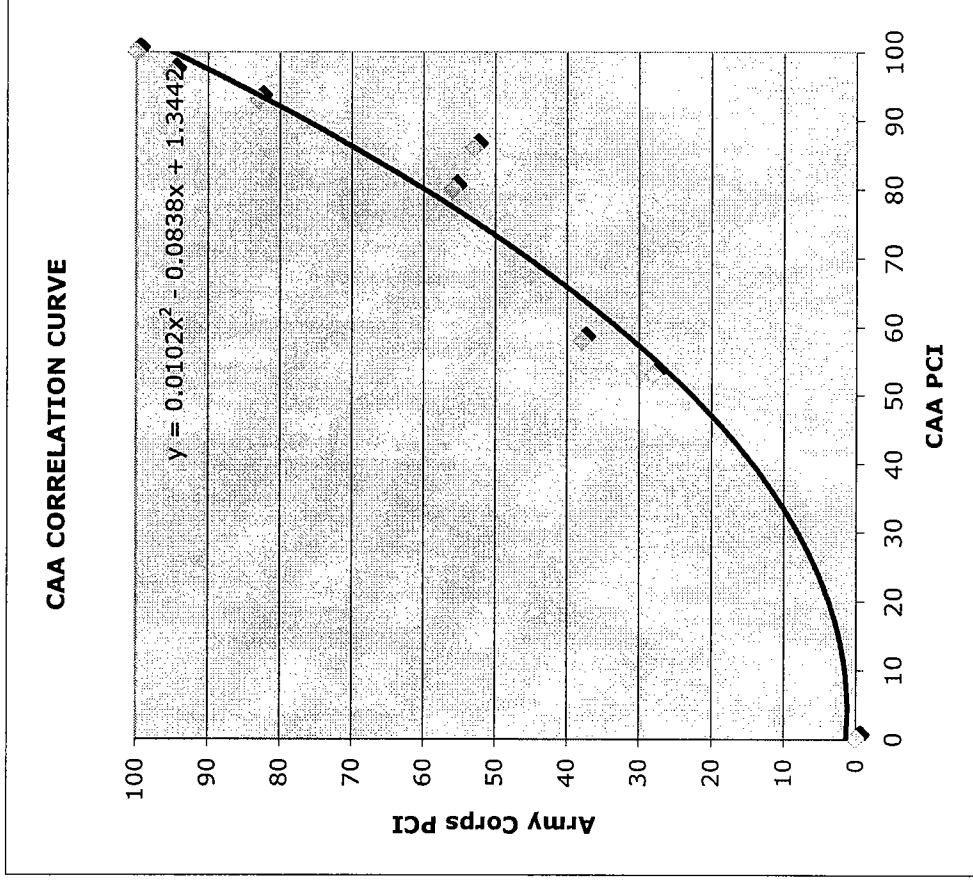


Metro PCI Correlation Curves

PMS System: CAA

A series of test values were used to compute results using both the CAA system and an Army Corps system.
 A curve was developed from this data.

CAA	ACOE
53	28
97	95
80	56
93	83
86	53
58	38
100	100
0	0

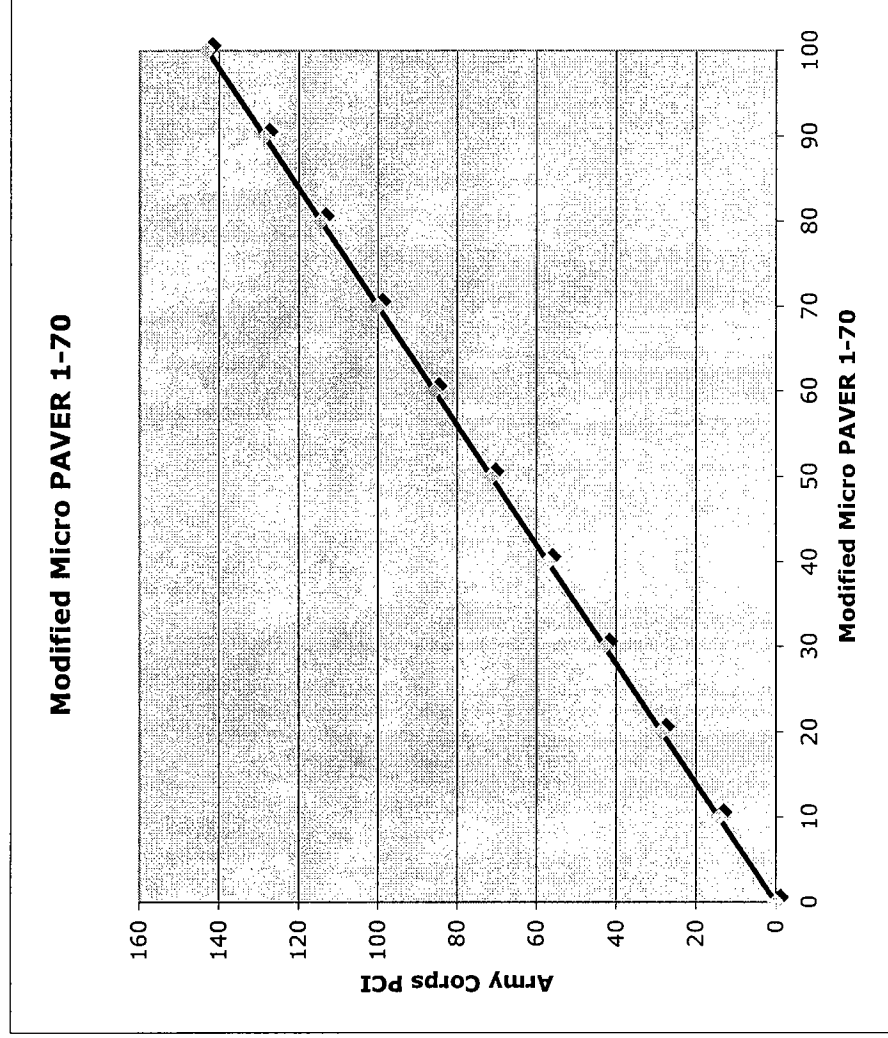


Metro PCI Correlation Curves

PMS System: Modified Micro PAVER 1-70

The Modified Micro PAVER system provides a PCI value from 0-70 with 70 being the highest.

MMP 1-70	ACOE
0	0
10	14
20	29
30	43
40	57
50	71
60	86
70	100
80	114
90	129
100	143



Metro PCI Correlation Curves

PMS System	Equation
Berryman & Henigar	$y = -0.0042x^2 + 1.4167x + 3E-14$
CarteGraph Pavementview Plus	$y = x$
Charles Abbot Assoc	$y = 0.102x^2 - 0.0838x + 1.3442$
Check PMS Plus	Need Surrogate
Cititech	$y = -0.0076x^2 + 1.6813x + 3.0464$
Engineer's judgment	Need Surrogate
Hansen's PMS	Need Surrogate
In House	Need Surrogate
Infra Manager by CHEC	$y = x$
Infrastructure Management Services (IMS)	$y = 0.0067x^2 + 0.3802x - 2.6908$
ITX Stanley	$y = x^{*10}$
L.A. County Road Dep.	Need Surrogate
LACDPW	Need Surrogate
Micro PAVER	$y = x$
Modified Micro PAVER 1-70	$y = 100/70^{*}x$
MTC StreetSaver	$y = x$
Nichols Consulting Engineers	$y = x$
No PMS System	Need Surrogate
Pavement Condition Inventory	Need Surrogate
Pavement Management System Inc.	Need Surrogate
Stantec PMS	$y = x^{*10}$
Stantec Super PMS	$y = x^{*10}$
SuperPMS (ITX Stanley)	$y = x^{*10}$
Willdan PMS	Need Surrogate
5-Year Pavement Rehabilitation Program	Need Surrogate

Surrogate PCI Thresholds

Jurisdiction	Jurisdictions with Similar Conditions				Surrogate Threshold
	Soil Type	+ Topographic Condition	+Traffic Volumes	+Truck Volumes	
Avalon			Use Systemwide Average		62
Azusa	San Dimas, La Verne	San Dimas, La Verne	San Dimas, La Verne	San Dimas, La Verne	85
Baldwin Park	Covina, San Dimas, La Verne	Covina, San Dimas, La Verne	Covina, San Dimas, La Verne	Covina, San Dimas, La Verne	70
Beverly Hills	Arcadia, Burbank, Glendale, Pasadena	Arcadia, Burbank, Pasadena	Burbank, Pasadena	Burbank, Pasadena	75
Bradbury	San Dimas, La Verne	San Dimas, La Verne	San Dimas, La Verne	San Dimas, La Verne	85
Claremont	Duarte, San Dimas	Duarte, San Dimas	Duarte, San Dimas	Duarte, San Dimas	55
Commerce	Norwalk, Pico Rivera, San Gabriel, Santa Fe Springs	Norwalk, Pico Rivera, San Gabriel, Santa Fe Springs	Norwalk, Pico Rivera, San Gabriel, Santa Fe Springs	Norwalk, Pico Rivera, San Gabriel, Santa Fe Springs	55
Cudahy	Bell, Bell Garden, Cerritos, Downey, Huntington Park, Norwalk, Pico Rivera, San Gabriel, Santa Fe Springs	Bell, Bell Garden, Cerritos, Downey, Huntington Park, Pico Rivera, San Gabriel, Santa Fe Springs	Bell, Bell Garden, Cerritos, Downey, Huntington Park, Pico Rivera, San Gabriel, Santa Fe Springs	Bell, Bell Garden, Cerritos, Downey, Huntington Park, Pico Rivera, San Gabriel, Santa Fe Springs	70
El Monte	Duarte, San Dimas	Duarte, San Dimas	Duarte, San Dimas	Duarte, San Dimas	44
Glendora	South Pasadena, Alhambra, Palmdale, Palos Verdes	South Pasadena, Alhambra, Palmdale, Palos Verdes	Agoura Hills	Agoura Hills	69
Hidden Hills	Norwalk, Pico Rivera, San Gabriel, Santa Fe Springs	Norwalk, San Gabriel, Santa Fe Springs	Norwalk, San Gabriel, Santa Fe Springs	Norwalk, Pico Rivera, San Gabriel, Santa Fe Springs	70
Industry	Whittier, Santa Fe Springs	Whittier, Santa Fe Springs	Whittier, Santa Fe Springs	Whittier, Santa Fe Springs	44
Inwindale			Use Systemwide Average		70
La Habra Heights	Norwalk, Pico Rivera, San Gabriel, Santa Fe Springs	Norwalk, Pico Rivera, San Gabriel, Santa Fe Springs	Norwalk, Pico Rivera, San Gabriel, Santa Fe Springs	Norwalk, Pico Rivera, San Gabriel, Santa Fe Springs	80
La Mirada	Compton, Gardena, Hawthorne, Long Beach	Compton, Gardena, Hawthorne	Gardena, Hawthorne	Gardena, Hawthorne	80
Lakewood	Bell, Bell Garden, Cerritos, Downey, Huntington Park,	Bell, Bell Garden, Cerritos, Downey, Huntington Park,	Palmdale, Bell	Palmdale, Bell	70
Lancaster					50

Surrogate PCI Thresholds

Jurisdiction	Jurisdictions with Similar Conditions				Surrogate Threshold
	Soil Type	+ Topographic Condition	+Traffic Volumes	+Truck Volumes	
Lynwood	Bell, Bell Garden, Cerritos, Downey, Huntington Park, Arcadia, Burbank, Glendale, Pasadena	Bell, Bell Garden, Cerritos, Downey, Huntington Park, Arcadia, Burbank, Pasadena	Bell, Bell Garden, Cerritos, Downey, Huntington Park, Arcadia, Burbank	Bell, Bell Garden, Cerritos, Downey, Huntington Park, Arcadia, Burbank	57
Monrovia	Norwalk, San Gabriel, Santa Fe Springs	Norwalk, San Gabriel, Santa Fe Springs	Norwalk, San Gabriel, Santa Fe Springs	Norwalk, San Gabriel, Santa Fe Springs	55
Pico Rivera	Diamond Bar, Palos Verdes Estates	Diamond Bar, Palos Verdes Estates	Diamond Bar, Palos Verdes Estates	Diamond Bar, Palos Verdes Estates	63
Rolling Hills Estates	Bell, Bell Garden, Cerritos, Downey, Huntington Park	Bell, Bell Garden, Cerritos, Downey, Huntington Park	Palmdale, Huntington Park	Palmdale, Huntington Park	78
San Fernando	Bell, Bell Garden, Cerritos, Downey, Huntington Park	Bell, Bell Garden, Cerritos, Downey, Huntington Park	Palmdale, Huntington Park	Palmdale, Huntington Park	61
South El Monte	Bell, Bell Garden, Cerritos, Downey, Huntington Park, San Marino, Huntington Park	Bell, Bell Garden, Cerritos, Downey, Huntington Park, San Marino, Huntington Park	Bell, Bell Garden, Cerritos, Downey, Huntington Park, San Marino, Huntington Park	Bell, Bell Garden, Cerritos, Downey, Huntington Park, San Marino, Huntington Park	57
South Pasadena	West Covina, San Dimas	West Covina, San Dimas	West Covina, San Dimas	West Covina, San Dimas	51
Walnut	Agoura Hills, Alhambra, Palmdale, Palos Verdes	Agoura Hills, Alhambra, Palmdale, Palos Verdes	Agoura Hills, Palmdale	Agoura Hills, Palmdale	78
Westlake Village					55

Unmet Cost Data

Jurisdiction	Total Lane Miles	Backlog Response	Funding Response	Unmet Cost Data
Responding Jurisdictions				
* Symbol means backlog was changed to match funding				
Agoura Hills	134	\$9,000,000	\$1,059,470	\$7,940,530
Alhambra	330	\$7,000,000	\$1,000,000	\$6,000,000
Arcadia	500	\$6,318,288	\$600,000	\$5,718,288
Artesia	62	\$3,500,000	\$200,000	\$3,300,000
Azusa	192	\$8,000,000	\$0	\$8,000,000
Baldwin Park	229	\$7,100,000	\$300,000	\$6,800,000
Bell	86	\$300,000	\$0	\$300,000
Bell Garden	101	\$2,500,000	\$1,500,000	\$1,000,000
Bellflower	246	\$24,000,000	\$270,000	\$23,730,000
Beverly Hills	214	\$10,000,000	\$500,000	\$9,500,000
Burbank	546	\$38,011,900	\$1,200,000	\$36,811,900
Carson	420	\$1,800,000	\$300,000	\$1,500,000
Cerritos	364	\$4,000,000	\$1,200,000	\$2,800,000
Claremont	231	\$2,000,000	\$945,988	\$1,054,012
Commerce	153	\$2,000,000	\$400,000	\$1,600,000
Compton	415	\$3,200,000 *	\$3,200,000	\$0
Covina	274	\$8,700,000	\$1,100,000	\$7,600,000
Cudahy	62	\$1,300,000	\$550,000	\$750,000
Culver City	216	\$17,945,034	\$1,800,000	\$16,145,034
Diamond Bar	293	\$1,894,000	\$1,650,000	\$244,000
Downey	503	\$4,886,800	\$2,010,000	\$2,876,800
Duarte	110	\$1,500,000	\$0	\$1,500,000
El Monte	363	\$1,500,000	\$175,000	\$1,325,000
El Segundo	130	\$17,500,000	\$250,000	\$17,250,000
Gardena	220	\$4,000,000	\$2,685,000	\$1,315,000
Glendale	790	\$5,900,000 *	\$5,900,000	\$0
Hawaiian Gardens	38	\$250,000	\$0	\$250,000
Hawthorne	390	\$4,000,000	\$700,000	\$3,300,000
Hermosa Beach	88	\$637,760	\$0	\$637,760
Huntington Park	171	\$1,600,000	\$405,000	\$1,195,000
Industry	175	\$10,730,000	\$1,199,100	\$9,530,900
Inglewood	444	\$25,000,000	\$5,000,000	\$20,000,000
Irwindale	58	\$6,000,000	\$1,000,000	\$5,000,000
La Canada Flintridge	180	\$400,000	\$400,000	\$0
La Mirada	260	\$14,334,894	\$8,065,000	\$6,269,894
La Puente	145	\$8,500,000	\$800,000	\$7,700,000
La Verne	235	\$8,300,000	\$1,500,000	\$6,800,000
Lakewood	425	\$6,600,000	\$1,000,000	\$5,600,000
Lancaster	1,137	\$20,085,000	\$4,320,000	\$15,765,000
Lawndale	85	\$2,000,000	\$1,200,000	\$800,000
Lomita	21	\$526,000	\$0	\$526,000
Long Beach	1,900	\$72,000,000	\$5,400,000	\$66,600,000
Los Angeles City	23,014	\$310,500,000	\$15,000,000	\$295,500,000
Los Angeles County Unincorporated	3,131	\$275,000,000	\$54,000,000	\$221,000,000
Lynwood	215	\$8,000,000	\$3,400,000	\$4,600,000
Malibu	94	\$930,000	\$120,000	\$810,000
Manhattan Beach	264	\$2,000,000	\$700,000	\$1,300,000
Maywood	160	\$3,200,000	\$0	\$3,200,000
Monrovia	189	\$4,300,000	\$0	\$4,300,000
Montebello	300	\$17,364,162	\$708,750	\$16,655,412
Monterey Park	275	\$20,000,000	\$1,370,000	\$18,630,000

Notes: Backlog Responses are from Survey Question # 9. Funding responses are from Question #10.

Lane miles given for major and secondary arterials only. One lane mile is 5,280 feet by 12 feet.

October 2007

Data - Unmet Costs - 22

Unmet Cost Data

Jurisdiction	Total Lane Miles	Backlog Response	Funding Response	Unmet Cost Data
Responding Jurisdictions				
* Symbol means backlog was changed to match funding				
Norwalk	580	\$9,800,000	\$1,800,000	\$8,000,000
Palmdale	803	\$8,000,000	\$2,200,000	\$5,800,000
Palos Verdes Estates	150	\$631,367 *	\$631,367	\$0
Paramount	167	\$4,400,000	\$2,621,000	\$1,779,000
Pasadena	775	\$8,400,000	\$700,000	\$7,700,000
Pico Rivera	320	\$1,800,000	\$1,000,000	\$800,000
Pomona	725	\$45,000,000	\$3,564,000	\$41,436,000
Rancho Palos Verdes	607	\$5,100,000	\$1,600,000	\$3,500,000
Redondo Beach	291	\$6,765,000	\$665,000	\$6,100,000
Rolling Hills Estates	95	\$1,400,000	\$0	\$1,400,000
Rosemead	212	\$4,100,000	\$0	\$4,100,000
San Dimas	250	\$33,000,000	\$65,000	\$32,935,000
San Fernando	106	\$2,700,000	\$576,995	\$2,123,005
San Gabriel	183	\$5,100,000	\$500,000	\$4,600,000
San Marino	132	\$2,100,000	\$800,000	\$1,300,000
Santa Clarita	760	\$24,344,637	\$1,000,000	\$23,344,637
Santa Monica	360	\$4,940,000	\$4,940,000	\$0
Sierra Madre	78	\$497,251	\$497,251	\$0
Signal Hill	120	\$2,217,600 *	\$2,217,600	\$0
South El Monte	304	\$2,360,000 *	\$2,360,000	\$0
South Gate	267	\$54,000,000	\$1,500,000	\$52,500,000
South Pasadena	130	\$1,000,000	\$50,000	\$950,000
Temple City	147	\$900,000	\$0	\$900,000
Torrance	726	\$50,000,000	\$11,000,000	\$39,000,000
Vernon	146	\$11,600,000	\$1,940,000	\$9,660,000
Walnut	245	\$2,057,000	\$0	\$2,057,000
West Covina	566	\$5,185,000	\$800,000	\$4,385,000
West Hollywood	97	\$6,460,000	\$350,000	\$6,110,000
Westlake Village	73	\$559,000	\$254,000	\$305,000
Whittier	600	\$6,300,000	\$1,500,000	\$4,800,000
Subtotal	50,594	\$1,326,830,693	\$180,215,521	\$1,146,615,172
Unit Cost / Lane Mile		\$26,225	\$3,562	\$22,663
Extrapolations for Jurisdictions with Missing Responses				
Avalon	12	\$314,699	\$42,744	\$271,955
Bradbury	6	\$167,839	\$22,797	\$145,043
Calabasas	164	\$4,300,887	\$584,164	\$3,716,723
Glendora	350	\$9,168,232	\$1,245,266	\$7,922,966
Hidden Hills	2	\$52,450	\$7,124	\$45,326
La Habra Heights	82	\$2,150,443	\$292,082	\$1,858,362
Santa Fe Springs	286	\$7,500,327	\$1,018,725	\$6,481,602
Subtotal	902	\$23,654,878	\$3,212,901	\$20,441,977
Grand Total	51,497	\$1,350,485,571	\$183,428,422	\$1,167,057,149

Notes: Backlog Responses are from Survey Question # 9. Funding responses are from Question #10.

Lane miles given for major and secondary arterials only. One lane mile is 5,280 feet by 12 feet.

October 2007

Data - Unmet Costs - 23

Annual Cost Data

Jurisdiction	Total Lane Miles	Annual Cost Data
Responding Jurisdictions		
Alhambra	330	\$1,000,000
Arcadia	500	\$750,000
Artesia	62	\$200,000
Baldwin Park	229	\$690,000
Bell	86	\$76,000
Bell Garden	101	\$2,200,000
Bellflower	246	\$1,500,000
Beverly Hills	214	\$1,000,000
Burbank	546	\$14,545,000
Carson	420	\$2,200,000
Cerritos	364	\$2,000,000
Claremont	231	\$590,816
Commerce	153	\$1,000,000
Compton	415	\$3,000,000
Covina	274	\$2,700,000
Cudahy	62	\$275,000
Culver City	216	\$2,200,000
Diamond Bar	293	\$850,000
Downey	503	\$750,000
Duarte	110	\$300,000
El Segundo	130	\$800,000
Gardena	220	\$1,400,000
Glendale	790	\$8,930,000
Hawaiian Gardens	38	\$90,000
Hawthorne	390	\$1,000,000
Hermosa Beach	88	\$637,760
Huntington Park	171	\$65,000
Industry	175	\$300,000
Inglewood	444	\$1,000,000
Irwindale	58	\$200,000
La Canada Flintridge	180	\$500,000
La Puente	145	\$2,100,000
La Verne	235	\$1,000,000
Lakewood	425	\$2,800,000
Lancaster	1,137	\$4,000,000
Lawndale	85	\$500,000
Lomita	21	\$100,000
Long Beach	1,900	\$8,000,000
Los Angeles City	23,014	\$37,600,000
Los Angeles County Unincorporated	3,131	\$29,000,000
Lynwood	215	\$500,000
Malibu	94	\$50,000
Maywood	160	\$3,200,000
Monrovia	189	\$750,000
Montebello	300	\$17,364,161
Monterey Park	275	\$3,100,000
Norwalk	580	\$800,000
Palmdale	803	\$2,500,000
Paramount	167	\$385,000
Pasadena	775	\$2,200,000
Pico Rivera	320	\$1,000,000

Notes: Annual Cost Responses are from Question #14.

Lane miles given for major and secondary arterials only. One lane mile is 5280 feet by 12 feet.

October 2007

Annual Cost Data

Jurisdiction	Total Lane Miles	Annual Cost Data
Responding Jurisdictions		
Pomona	725	\$4,500,000
Rancho Palos Verdes	607	\$500,000
Redondo Beach	291	\$1,400,000
Rolling Hills Estates	95	\$320,000
Rosemead	212	\$490,000
San Dimas	250	\$500,000
San Fernando	106	\$300,000
San Gabriel	183	\$900,000
San Marino	132	\$70,000
Santa Fe Springs	286	\$3,000,000
Santa Monica	360	\$4,900,000
Sierra Madre	78	\$150,000
Signal Hill	120	\$772,499
South Gate	267	\$450,000
South Pasadena	130	\$200,000
Temple City	147	\$70,000
Torrance	726	\$5,000,000
Vernon	146	\$3,000,000
Walnut	245	\$100,000
West Covina	566	\$100,000
West Hollywood	97	\$1,750,000
Westlake Village	73	\$600,000
Subtotal	47,852	\$198,771,236
Unit Cost / Lane Mile		\$4,154
Extrapolated Jurisdictions		
Agoura Hills	134	\$558,278
Avalon	12	\$49,846
Azusa	192	\$798,703
Bradbury	6	\$26,585
Calabasas	164	\$681,232
El Monte	363	\$1,509,345
Glendora	350	\$1,452,188
Hidden Hills	2	\$8,308
La Habra Heights	82	\$340,616
La Mirada	260	\$1,080,002
Manhattan Beach	264	\$1,096,618
Palos Verdes Estates	150	\$623,078
Santa Clarita	760	\$3,156,930
South El Monte	304	\$1,262,772
Whittier	600	\$2,492,313
Subtotal	3,644	\$15,136,815
County Totals	51,497	\$213,908,051

Notes: Annual Cost Responses are from Question # 14.

Lane miles given for major and secondary arterials only. One lane mile is 5280 feet by 12 feet.

October 2007