2018 STATE OF THE PAVEMENT REPORT

DIVISION OF MAINTENANCE
PAVEMENT PROGRAM
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Caltrans®

This report is prepared by the California Department of Transportation, Division of Maintenance, Office of Pavement Management and the Office of Pavement Programming.

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EXECUTIVE SUMMARY

As the steward of the State Highway System (S.H.S.), the California Department of Transportation (Caltrans) is responsible for maintaining over 50,000 lane-miles of pavement along more than 255 state and interstate highways. The State of the Pavement Report presents the latest pavement condition of the S.H.S., recent pavement project expenditures, and financial plan for future pavement improvements.

Caltrans conducts an automated pavement condition survey (A.P.C.S.) to collect pavement data at highway speeds for all lanes along the S.H.S. A.P.C.S. vehicles are equipped with various on-board equipment, high-definition cameras, and laser sensors to collect pavement images and pavement surface profiles. Pavement condition is reported for every 0.1-mile.

The 2018 State of the Pavement Report is based on the A.P.C.S. data collected in the 2018 calendar year. Pavement condition data was not collected in 2017 due to a delay in awarding the A.P.C.S. contract caused by protests from vendors who did not win the contract. The 2018 State of the Pavement Report presents pavement condition in accordance with two analysis methodologies:

1) The National Highway Performance Program's (N.H.P.P.) pavement performance measures codified under Title 23, Code of Federal Regulations, Part 490, Subpart C (23 C.F.R. 490, Subpart C);
2) The Caltrans pavement rating system.

23 C.F.R. 490, Subpart C, measures pavement performance as *Good*, *Fair*, and *Poor* based on an assessment of several distress metrics combined. Table 1 presents the 2016 and 2018 statewide pavement condition by roadway classification based on the federal performance measures. The pavement condition improved in 2018 compared to 2016. The lane-miles of *Good* pavement increased while the lane-miles of Fair and Poor pavement decreased.

TABLE 1. STATEWIDE PAVEMENT CONDITION SUMMARY BY ROADWAY CLASSIFICATION BASED ON FEDERAL PERFORMANCE MEASURES

Roadway Class	2016 Good Lane-Miles	2016 Fair Lane-Miles	2016 Poor Lane-Miles	2016 Sub-Total	2018 Good Lane-Miles	2018 Fair Lane-Miles	2018 Poor Lane-Miles	2018 Sub-Total
Class 1	15,682 (57.6%)	11,120 (40.9%)	406 (1.5%)	27,208 (100%)	17,659 (65.1%)	9,138 (33.7%)	349 (1.3%)	27,145 (100%)
Class 2	6,331 (38.6%)	9,851 (60.1%)	222 (1.4%)	16,403 (100%)	7,543 (46.0%)	8,720 (53.2%)	140 (0.9%)	16,403 (100%)
Class 3	2,413 (35.8%)	4,210 (62.5%)	112 (1.7%)	6,735 (100%)	2,854 (42.5%)	3,786 (56.4%)	72 (1.1%)	6,713 (100%)
Statewide Total	24,426 (48.5%)	25,181 (50.0%)	739 (1.5%)	50,346 (100%)	28,056 (55.8%)	21,644 (43.1%)	560 (1.1%)	50,261 (100%)

The Caltrans pavement rating system uses a different methodology than the Federal measures. Caltrans designates the color *Green* for pavement with no distress or very low distress, the color *Yellow* for pavement with minor surface distress, and the color *Red* for pavement with structural distress or poor ride quality. Through this monitoring and assessment effort, Caltrans can proactively apply the most cost-effective preventive and corrective treatments to minimize pavement deterioration and bring it to a state of good repair. Table 2 presents the 2016 and 2018 statewide pavement condition based on the Caltrans rating system. Overall, the pavement condition is better in 2018 compared to 2016.

TABLE 2. STATEWIDE PAVEMENT CONDITION SUMMARY BY ROADWAY CLASSIFICATIONS BASED ON CALTRANS RATING SYSTEM

Roadway Class	2016 Green Lane-Miles	2016 Yellow Lane-Miles	2016 Red Lane-Miles	2016 Sub-Total	2018 Green Lane-Miles	2018 Yellow Lane-Miles	2018 Red Lane-Miles	2018 Sub-Total
Class 1	20,374 (74.9%)	3,906 (14.4%)	2,927 (10.8%)	27,208 (100%)	22,319 (82.2%)	2,918 (10.7%)	1,909 (7.0%)	27,145 (100%)
Class 2	8,143 (49.6%)	4,304 (26.2%)	3,956 (24.1%)	16,403 (100%)	9,517 (58.0%)	4,120 (25.1%)	2,765 (16.9%)	16,403 (100%)
Class 3	2,938 (43.6%)	1,705 (25.3%)	2,091 (31.0%)	6,735 (100%)	3,540 (52.7%)	1,680 (25.0%)	1,492 (22.2%)	6,713 (100%)
Statewide Total	31,455 (62.5%)	9,916 (19.7%)	8,975 (17.8%)	50,346 (100%)	35,376 (70.4%)	8,718 (17.3%)	6,166 (12.3%)	50,261 (100%)

In 2018, approximately 62 percent of total lane-miles collected were measured with an International Roughness Index (I.R.I.) of less than 95 inches per mile, 30 percent with an I.R.I. between 95 to 170 inches per mile, and 8 percent with an I.R.I. greater than 170 inches per mile. Overall, the pavement roughness improved in 2018 compared to 2016.

Caltrans is committed to using maintenance resources effectively to prolong the service life of the pavement and maintain the S.H.S. at the lowest possible long-term cost. The A.P.C.S. data also serves as a crucial component of Caltrans' Pavement Management System (PaveM). PaveM uses pavement condition data along with other information such as traffic census, climate region, and recent construction history to predict future pavement condition and recommend project locations viable for cost-effective treatments.

From Fiscal Year (F.Y.) 2015/16 through F.Y. 2017/18, Caltrans delivered approximately $2.9 billion in pavement projects on approximately 9,800 lane-miles of roadway. Table 3 summarizes the total capital costs and lane-miles for Highway Maintenance (H.M.1) and State Highway Operations and Protection Program (S.H.O.P.P.) pavement projects within the last three fiscal years. In F.Y. 2017/18, Caltrans delivered an additional $200 Million of H.M.1 projects, compared to the prior two fiscal years, with funding from the Road Maintenance and Rehabilitation Program authorized under Senate Bill 1 (2017-2018). This allowed Caltrans to accelerate and complete roadway maintenance projects that would have been deferred as a result of limited funding from the existing State Highway Account.

TABLE 3. AWARDED PAVEMENT IMPROVEMENTS CAPITAL COSTS AND LANE-MILES FROM F.Y. 2015/16 TO F.Y. 2017/18

Project Type	F.Y. 2015/16 Million Dollar[1]	F.Y. 2015/16 Lane-Miles	F.Y. 2016/17 Million Dollar[1]	F.Y. 2016/17 Lane-Miles	F.Y. 2017/18 Million Dollar[1]	F.Y. 2017/18 Lane-Miles	Total Million Dollar[1]	Total Lane-Miles
H.M.1	$219	1,808	$192	1,570	$482	2,488	$893	5,866
S.H.O.P.P. – C.A.P.M.	$353	1,312	$237	705	$290	907	$880	2,924
S.H.O.P.P. – Rehabilitation	$350	365	$457	376	$282	205	$1,089	946
S.H.O.P.P. – Minor A	$7	18	$1	6	$2	7	$10	31
S.H.O.P.P. – Sub-Total	$710	1,695	$695	1,087	$574	1,118	$1,979	3,900
Total H.M.1 & S.H.O.P.P.	$929	3,503	$887	2,657	$1,056	3,606	$2,872	9,766

[1] Costs associated to pavement-related contract bid items only and exclude project support costs. Does not include on-call maintenance contracts or Director's Order contracts.

STATE HIGHWAY SYSTEM

The S.H.S. primarily consists of two types of pavement: asphalt and concrete. Asphalt pavements include pavement surfaced with conventional hot mix asphalt (either open-graded or dense-graded), rubberized hot mix asphalt (either open-graded or gap-graded), chip seal, slurry seal, bonded wearing course, or other asphaltic materials. Asphalt pavement surfaces also include composite pavements with underlying concrete pavement. Concrete pavements include pavement surfaced with concrete materials such as jointed plain concrete pavement (J.P.C.P.), continuously reinforced concrete pavement (C.R.C.P.), and precast concrete pavement.

Table 4 presents the statewide lane-miles of pavement, by type and excluding bridges and other structures, that were collected in the 2016 and 2018 A.P.C.S. cycles.

TABLE 4. STATEWIDE LANE-MILES OF A.P.C.S. DATA COLLECTED BY PAVEMENT TYPE

Pavement Type	2016 Lane-Miles Collected	2018 Lane-Miles Collected
Asphalt	37,096 (73.7%)	37,122 (73.9%)
Concrete	13,250 (26.3%)	13,138 (26.1%)
Statewide Total	50,346 (100%)	50,261 (100%)

The difference in the total lane-miles collected between 2016 and 2018 may be attributed to right-of-way relinquishments, new roadway pavement, new roadway re-alignment, or pavement locations where conditions could not be collected such as roadway closures for highway construction activities.

Table 5 presents the statewide lane-miles of pavement, by roadway classification, that were collected in the 2016 and 2018 A.P.C.S. cycles. For planning purposes, the S.H.S. has been classified into three roadway classifications:

- Roadway Class 1 contains route segments classified as Interstate and other principal arterials. It includes Freight Network Tier I and II, and the Strategic Highway Network (S.T.R.A.H.N.E.T.) routes. Examples of Class 1 routes are Sacramento-80, Alameda-580, Ventura-101, Los Angeles-210, and San Diego-8.
- Roadway Class 2 contains route segments classified as non-Interstate National Highway System and Interregional Road System (I.R.R.S.). It

includes Freight Network Tier 3. Examples of Class 2 routes are Mendocino-20, Napa-29, Monterey-1, Riverside-74, and Orange-73.

- Roadway Class 3 contains all other routes not included in Classes 1 and 2. Examples of Class 3 routes are Trinity-3, Humbolt-36, San Luis Obispo-58, and Mono-167.

TABLE 5. STATEWIDE LANE-MILES OF A.P.C.S. DATA COLLECTED BY ROADWAY CLASSIFICATION

Roadway Class	2016 Lane-Miles Collected	2018 Lane-Miles Collected
Class 1	27,208 (54.0%)	27,145 (54.0%)
Class 2	16,403 (32.6%)	16,403 (32.6%)
Class 3	6,735 (13.4%)	6,713 (13.4%)
Statewide Total	50,346 (100%)	50,261 (100%)

The S.H.S. includes the Interstate System, other roadways along the National Highway System (N.H.S.), and Non-N.H.S. roadways. Table 6 presents the statewide lane-miles of pavement, by highway type, that were collected in the 2016 and 2018 A.P.C.S. cycles.

TABLE 6. STATEWIDE LANE-MILES OF A.P.C.S. DATA COLLECTED BY HIGHWAY TYPE

Highway Type	2016 Lane-Miles Collected	2018 Lane-Miles Collected
N.H.S. – Interstate	14,473 (28.7%)	14,411 (28.7%)
N.H.S. – Non-Interstate	22,750 (45.2%)	22,765 (45.3%)
N.H.S. Sub-Total	37,223 (73.9%)	37,176 (74.0%)
Non-N.H.S.	13,123 (26.1%)	13,085 (26.0%)
Statewide Total	50,346 (100%)	50,261 (100%)

There are 12 Caltrans regional districts across California. Each district is responsible for managing and maintaining their respective portions of the S.H.S. network. Table 7 presents the statewide lane-miles of pavement, by district, that were collected in the 2016 and 2018 A.P.C.S. cycles.

TABLE 7. STATEWIDE LANE-MILES OF A.P.C.S. DATA COLLECTED BY DISTRICT

District	2016 Lane-Miles Collected	2018 Lane-Miles Collected
District 1	2,343 (4.7%)	2,326 (4.6%)
District 2	3,901 (7.7%)	3,970 (7.9%)
District 3	4,435 (8.8%)	4,439 (8.8%)
District 4	6,141 (12.2%)	6,184 (12.3%)
District 5	3,197 (6.4%)	3,175 (6.3%)
District 6	5,068 (10.1%)	5,095 (10.1%)
District 7	6,304 (12.5%)	6,255 (12.4%)
District 8	6,700 (13.3%)	6,663 (13.3%)
District 9	2,524 (5.0%)	2,563 (5.1%)
District 10	3,522 (7.0%)	3,520 (7.0%)
District 11	4,200 (8.3%)	4,097 (8.2%)
District 12	2,010 (4.0%)	1,976 (3.9%)
Statewide Total	50,346 (100%)	50,261 (100%)

A map of each Caltrans district's boundary is available in Appendix A.

PAVEMENT CONDITION MONITORING AND MANAGEMENT

Pavement Condition Monitoring

Historically, a team of pavement raters would conduct a manual pavement condition survey at various locations along the S.H.S. once a year. The pavement raters visually inspected the outside highway lanes for both directions of travel using systematic sampling techniques. Pavement condition assessments would be extrapolated for the entire S.H.S. based on those sample locations.

Between 2011 and 2012, Caltrans began testing and transitioning to A.P.C.S. to efficiently collect, evaluate, and analyze pavement condition for all lanes on the S.H.S. It utilizes vehicles equipped with an array of on-board high-definition cameras, laser sensors, Global Positioning System tracker, and other measurement devices that quickly collect pavement data at highway speeds. The data collected includes geographical locations of the highways, downward-looking pavement surface images, forward right-of-way images, and pavement surface profiles. For asphalt pavement and C.R.C.P., one data element is reported for every 26.4-foot section. For J.P.C.P., one data element is reported for each concrete slab. The data elements would be aggregated to calculate a weighted average of the pavement condition for each 0.1-mile segment.

Figure 1 presents the data collection methods for A.P.C.S. and manual inspection. The manual pavement inspection is now a component of the A.P.C.S. data validation process in compliance with 23 C.F.R. 490.319(c).

FIGURE 1. A.P.C.S. VEHICLE ON THE ROAD AND MANUAL PAVEMENT INSPECTION

Pavement Management System

The Pavement Management System (PaveM) is a versatile tool that assists Caltrans with analyzing existing pavement condition, predicting future pavement condition, and recommending pavement projects to achieve

targeted performance goals by data driven strategies. PaveM uses many data inputs such as pavement condition, traffic census, climate region, pavement treatments, and recent construction history to predict future pavement condition and recommend projects. The tool maximizes funding resources by recommending cost-effective treatments at specific time of the pavement's life to prolong its serviceability.

FEDERAL PAVEMENT PERFORMANCE MEASURES

The Moving Ahead for Progress in the 21st Century Act (M.A.P.-21) established a performance-based objective that directs States to make smart transportation investment decisions and work toward achieving seven national performance goals. One of the national goals is pavement performance. The National Highway Performance Program (N.H.P.P.) was enacted under M.A.P.-21 and continued under the Fixing America's Surface Transportation Act (F.A.S.T. Act) to provide guidance for States to meet the national goals. In accordance with the N.H.P.P., the Federal pavement performance measures are codified under 23 C.F.R. 490, Subpart C.

23 C.F.R. 490, Subpart C, determines pavement performance measures based on a combination of different pavement distress metrics. Asphalt pavement metrics are surface roughness according to the International Roughness Index (I.R.I.), cracking, and rutting. Concrete pavement metrics are I.R.I., cracking, and faulting. The metrics are rated as *Good*, *Fair*, and *Poor* based on a set of criteria for each pavement type. Table 8 presents the performance metrics and measures criteria for each pavement type. *Good* pavement measure is represented as green, *Fair* pavement measure is represented as light-purple, and *Poor* pavement measure is represented as purple.

TABLE 8. FEDERAL PAVEMENT PERFORMANCE METRICS AND MEASURES CRITERIA

Performance Metrics	Good	Fair	Poor
I.R.I. (inches per mile)	Less than 95	Between 95 to 170	Greater than 170
Cracking (percentage) for Asphalt Pavement	Less than 5	Between 5 to 20	Greater than 20
Cracking (percentage) for J.P.C.P.	Less than 5	Between 5 to 15	Greater than 15
Cracking (percentage) for C.R.C.P.	Less than 5	Between 5 to 10	Greater than 10
Rutting (inch) for Asphalt Pavement	Less than 0.2	Between 0.2 to 0.4	Greater than 0.4
Faulting (inch) for J.P.C.P.	Less than 0.10	Between 0.10 to 0.15	Greater than 0.15

For asphalt pavement and J.P.C.P., the overall condition of a pavement section will be considered *Good* if all three performance metrics (I.R.I., cracking, and rutting or faulting) are rated as *Good*. If two or more performance metrics are rated as *Poor*, then the pavement section is considered *Poor*. All other condition combinations are considered as *Fair*.

For C.R.C.P., the overall condition of a pavement section will be considered *Good* if both performance metrics (I.R.I. and cracking) are rated as *Good*. If both performance metrics are rated as *Poor*, then the pavement section is considered as *Poor*. All other condition combinations are considered as *Fair*. There are approximately 483 lane-miles of C.R.C.P. along the S.H.S. These locations are currently considered to be in good condition because they are relatively new and recent constructions. Caltrans will continue monitoring these locations and will evaluate their condition for future reports.

Table 9 presents the statewide pavement performance targets established by Caltrans for each roadway classification and performance measure.

TABLE 9. STATEWIDE PAVEMENT PERFORMANCE TARGETS FOR EACH ROADWAY CLASSIFICATION AND FEDERAL PERFORMANCE MEASURE

Roadway Class	Good	Fair	Poor
Class 1	60%	39%	1%
Class 2	55%	43%	2%
Class 3	45%	53%	2%

Pavement Condition Statewide

Overall Pavement Condition

Table 10 presents the 2016 and 2018 statewide pavement condition based on the Federal performance measures. The pavement condition improved in 2018 compared to 2016. The lane-miles of *Good* pavement increased while the lane-miles of *Fair* and *Poor* pavement decreased.

TABLE 10. STATEWIDE PAVEMENT CONDITION SUMMARY BASED ON FEDERAL PERFORMANCE MEASURES

Federal Measure	2016 Lane-Miles	2018 Lane-Miles
Good	24,426 (48.5%)	28,056 (55.8%)
Fair	25,181 (50.0%)	21,644 (43.1%)
Poor	739 (1.5%)	560 (1.1%)
Statewide Total	50,346 (100%)	50,261 (100%)

Condition by Pavement Type

Table 11 presents the 2016 and 2018 statewide pavement condition by pavement type based on the Federal performance measures. The pavement condition of both asphalt and concrete pavement improved in 2018 compared to 2016.

TABLE 11. STATEWIDE PAVEMENT CONDITION SUMMARY BY PAVEMENT TYPE BASED ON FEDERAL PERFORMANCE MEASURES

Federal Measure	2016 Asphalt Lane-Miles	2016 Concrete Lane-Miles	2018 Asphalt Lane-Miles	2018 Concrete Lane-Miles
Good	18,694	5,732	21,399	6,657
Fair	18,072	7,109	15,518	6,126
Poor	330	409	205	356
Statewide Total	37,096	13,250	37,122	13,138

Condition by Roadway Class

Table 12 presents the 2016 and 2018 statewide pavement condition by roadway classifications based on the Federal performance measures. Pavement condition improved for all roadway classes in 2018 compared to 2016.

TABLE 12. STATEWIDE PAVEMENT CONDITION SUMMARY BY ROADWAY CLASSIFICATION BASED ON FEDERAL PERFORMANCE MEASURES

Roadway Class	2016 Good Lane-Miles	2016 Fair Lane-Miles	2016 Poor Lane-Miles	2016 Sub-Total	2018 Good Lane-Miles	2018 Fair Lane-Miles	2018 Poor Lane-Miles	2018 Sub-Total
Class 1	15,682 (57.6%)	11,120 (40.9%)	406 (1.5%)	27,208 (100%)	17,659 (65.1%)	9,138 (33.7%)	349 (1.3%)	27,145 (100%)
Class 2	6,331 (38.6%)	9,851 (60.1%)	222 (1.4%)	16,403 (100%)	7,543 (46.0%)	8,720 (53.2%)	140 (0.9%)	16,403 (100%)
Class 3	2,413 (35.8%)	4,210 (62.5%)	112 (1.7%)	6,735 (100%)	2,854 (42.5%)	3,786 (56.4%)	72 (1.1%)	6,713 (100%)
Statewide Total	24,426 (48.5%)	25,181 (50.0%)	739 (1.5%)	50,346 (100%)	28,056 (55.8%)	21,644 (43.1%)	560 (1.1%)	50,261 (100%)

Pavement condition for each district by roadway classification based on the Federal performance measures is available in Appendix B and Appendix C.

Condition by Highway Type

Table 13 presents the 2016 and 2018 statewide pavement condition by highway type based on the Federal performance measures. The pavement condition improved for all highway types in 2018 compared to 2016.

TABLE 13. STATEWIDE PAVEMENT CONDITION SUMMARY BY HIGHWAY TYPE BASED ON FEDERAL PERFORMANCE MEASURES

Highway Type	2016 Good Lane-Miles	2016 Fair Lane-Miles	2016 Poor Lane-Miles	2016 Sub-Total	2018 Good Lane-Miles	2018 Fair Lane-Miles	2018 Poor Lane-Miles	2018 Sub-Total
N.H.S. – Interstate	8,402 (58.1%)	5,816 (40.2%)	255 (1.8%)	14,473 (100%)	9,325 (64.7%)	4,888 (33.9%)	198 (1.4%)	14,411 (100%)
N.H.S. – Non-Interstate	11,251 (49.5%)	11,188 (49.2%)	312 (1.4%)	22,750 (100%)	12,972 (57.0%)	9,539 (41.9%)	254 (1.1%)	22,765 (100%)
N.H.S. – Sub-Total	19,652 (52.8%)	17,004 (45.7%)	566 (1.5%)	37,223 (100%)	22,298 (60.0%)	14,426 (38.8%)	452 (1.2%)	37,176 (100%)
Non-N.H.S.	4,773 (36.4%)	8,177 (62.3%)	173 (1.3%)	13,123 (100%)	5,758 (44.0%)	7,218 (55.2%)	109 (0.8%)	13,085 (100%)
Statewide Total	24,426 (48.5%)	25,181 (50.0%)	739 (1.5%)	50,346 (100%)	28,056 (55.8%)	21,644 (43.1%)	560 (1.1%)	50,261 (100%)

Pavement Condition by District

Table 14 presents the 2016 and 2018 statewide pavement condition by district based on the Federal performance measures. The lane-miles of *Good* pavement increased for all districts in 2018 compared to 2016. The lane-miles of *Fair* and *Poor* pavement decreased for all districts except for District 5 and District 8 where there was a slight increase in lane-miles of *Poor* pavement.

TABLE 14. STATEWIDE PAVEMENT CONDITION SUMMARY BY DISTRICT BASED ON FEDERAL PERFORMANCE MEASURES

District	2016 Good Lane-Miles	2016 Fair Lane-Miles	2016 Poor Lane-Miles	2016 Sub-Total	2018 Good Lane-Miles	2018 Fair Lane-Miles	2018 Poor Lane-Miles	2018 Sub-Total
District 1	990 (42.2%)	1,332 (56.8%)	22 (0.9%)	2,343 (100%)	1,125 (48.4%)	1,188 (51.1%)	13 (0.5%)	2,326 (100%)
District 2	1,853 (47.5%)	1,965 (50.4%)	83 (2.1%)	3,901 (100%)	2,368 (59.7%)	1,562 (39.3%)	39 (1.0%)	3,970 (100%)
District 3	2,444 (55.1%)	1,934 (43.6%)	57 (1.3%)	4,435 (100%)	2,604 (58.7%)	1,802 (40.6%)	32 (0.7%)	4,439 (100%)
District 4	2,445 (39.8%)	3,578 (58.3%)	118 (1.9%)	6,141 (100%)	2,693 (43.5%)	3,390 (54.8%)	101 (1.6%)	6,184 (100%)
District 5	1,458 (45.6%)	1,710 (53.5%)	28 (0.9%)	3,197 (100%)	1,714 (54.0%)	1,428 (45.0%)	33 (1.0%)	3,175 (100%)
District 6	3,009 (59.4%)	2,011 (39.7%)	47 (0.9%)	5,068 (100%)	3,274 (64.3%)	1,779 (34.9%)	41 (0.8%)	5,095 (100%)
District 7	2,152 (34.1%)	3,956 (62.8%)	196 (3.1%)	6,304 (100%)	2,648 (42.3%)	3,463 (55.4%)	143 (2.3%)	6,255 (100%)
District 8	3,553 (53.0%)	3,053 (45.6%)	94 (1.4%)	6,700 (100%)	3,759 (56.4%)	2,798 (42.0%)	106 (1.6%)	6,663 (100%)
District 9	1,832 (72.6%)	687 (27.2%)	5 (0.2%)	2,524 (100%)	2,065 (80.6%)	494 (19.3%)	4 (0.2%)	2,563 (100%)
District 10	1,837 (52.2%)	1,623 (46.1%)	62 (1.8%)	3,522 (100%)	2,361 (67.1%)	1,128 (32.1%)	31 (0.9%)	3,520 (100%)
District 11	1,991 (47.4%)	2,192 (52.2%)	17 (0.4%)	4,200 (100%)	2,452 (59.8%)	1,635 (39.9%)	10 (0.3%)	4,097 (100%)
District 12	862 (42.9%)	1,140 (56.7%)	8 (0.4%)	2,010 (100%)	994 (50.3%)	975 (49.4%)	7 (0.4%)	1,976 (100%)
Statewide Total	24,426 (48.5%)	25,181 (50.0%)	739 (1.5%)	50,346 (100%)	28,056 (55.8%)	21,644 (43.1%)	560 (1.1%)	50,261 (100%)

CALTRANS PAVEMENT RATING SYSTEM

The Caltrans pavement rating system utilizes a different methodology than the Federal measures. The Caltrans pavement rating system designates the color *Green* for pavement with no distress or very low distress, the color *Yellow* for pavement with minor cracking or surface distress, and the color *Red* for distressed pavement that has structural distress or poor ride quality. This is referred to as the R.Y.G. (Red, Yellow, and Green) designation.

Preventive treatments would typically be applied to the *Green* pavement to maintain and prolong its good condition. *Yellow* pavement would receive corrective treatments to slow pavement deterioration. *Red* distressed pavement would need more substantial rehabilitation treatments to bring it to a state of good repair or complete reconstruction and replacement.

To determine the appropriate treatments for the distressed pavement, the *Red* pavement is further subdivided into the color *Blue* for pavement with poor ride quality, the color *Orange* for pavement with minor structural distress, and the color *Red* for pavement with major structural distress. Along with the prior *Green* and *Yellow* pavements, this is referred to as the R.O.B.Y.G. (Red, Orange, Blue, Yellow, and Green) designation. Figure 2 presents examples of the pavement condition for each category of the R.O.B.Y.G. designation.

FIGURE 2. EXAMPLES OF PAVEMENT CONDITION BASED ON CALTRANS RATING SYSTEM

Green

No Distress

Yellow

Minor Surface Distress

Blue

Poor Ride Only

Orange

Minor Structural Distress

Red

Major Structural Distress

Table 15 presents the Caltrans pavement condition rating priority matrix for asphalt pavement. Figure 3 presents examples of distress for asphalt pavement.

TABLE 15. CALTRANS CONDITION RATING PRIORITY MATRIX FOR ASPHALT PAVEMENT

Alligator B Cracking (percentage) Rating Criteria	Alligator A Plus Alligator B Cracking (percentage) Rating Criteria	I.R.I. (inches per mile) Rating Criteria	R.Y.G. Rating	R.O.B.Y.G. Rating	Condition Rating
Less than 5%	Less than 5%	Less than or equal to 170	Green	Green	Low I.R.I., Very Low B Cracking, Very Low A Cracking
Less than 5%	Greater than or equal to 5%	Less than or equal to 170	Yellow	Yellow	A Plus B Cracking
Greater than or equal to 5%, and less than 10%	Any value	Less than or equal to 170	Yellow	Yellow	Low B Cracking
Less than 5%	Any value	Greater than 170	Red	Blue	High I.R.I. Only
Greater than or equal to 5%, and less than 10%	Any value	Greater than 170	Red	Blue	High I.R.I., Low B Cracking
Between 10% and 30%	Any value	Any value	Red	Orange	Medium B Cracking
Greater than 30%	Any value	Any value	Red	Red	High B Cracking

FIGURE 3. EXAMPLES OF DISTRESS FOR ASPHALT PAVEMENT

Alligator A Cracking

Alligator B Cracking

Table 16 presents the Caltrans pavement condition rating priority matrix for jointed plain concrete pavement. Figure 4 presents examples of distress for concrete pavement.

TABLE 16. CALTRANS CONDITION RATING PRIORITY MATRIX FOR JOINTED PLAIN CONCRETE PAVEMENT

3rd Stage Cracking (Percentage) Rating Criteria	Faulting[2] (Percentage) Rating Criteria	I.R.I. (inches per mile) Rating Criteria	R.Y.G. Rating	R.O.B.Y.G. Rating	Condition Rating
Less than 3%	Less than or equal to 25%	Less than or equal to 170	Green	Green	Low I.R.I., Low Cracking, Low Faulting
Between 3% and 10%	Less than or equal to 25%	Less than or equal to 170	Yellow	Yellow	Medium Cracking Only
Less than 3%	Less than or equal to 25%	Greater than 170	Red	Blue	High I.R.I. Only
Between 3% and 10%	Less than or equal to 25%	Greater than 170	Red	Blue	High I.R.I., Medium Cracking, Low Faulting
Less than 3%	Greater than 25%	Any value	Red	Orange	High Faulting, Low Cracking
Between 3% and 10%	Greater than 25%	Any value	Red	Orange	High Faulting, Medium Cracking
Greater than 10%	Any value	Any value	Red	Red	High Cracking

[2] Faulting percent of elements with fault height greater than 0.15 inch.

FIGURE 4. EXAMPLES OF DISTRESS FOR CONCRETE PAVEMENT

3rd Stage Cracking

Faulting

Pavement Condition Statewide

Overall Pavement Condition

Table 17 presents the 2016 and 2018 statewide pavement condition based on the Caltrans rating system. The pavement condition improved in 2018 compared to 2016. The amount of *Green* pavement increased while the amount of *Yellow* and *Red* pavement decreased.

TABLE 17. STATEWIDE PAVEMENT CONDITION SUMMARY BASED ON CALTRANS RATING SYSTEM

Caltrans Rating System	2016 Lane-miles	2018 Lane-miles
Green	31,455 (62.5%)	35,376 (70.4%)
Yellow	9,916 (19.7%)	8,718 (17.3%)
Red	8,975 (17.8%)	6,166 (12.3%)
Statewide Total	50,346 (100%)	50,261 (100%)

Condition by Pavement Type

Table 18 presents the 2016 and 2018 statewide pavement condition by pavement type based on the Caltrans rating system. The condition of both asphalt and concrete pavement improved in 2018 compared to 2016.

TABLE 18. STATEWIDE PAVEMENT CONDITION SUMMARY BY PAVEMENT TYPE BASED ON CALTRANS RATING SYSTEM

Caltrans Rating System	2016 Asphalt Lane-Miles	2016 Concrete Lane-Miles	2018 Asphalt Lane-Miles	2018 Concrete Lane-Miles
Green	21,183	10,272	24,338	11,038
Yellow	8,741	1,175	8,108	610
Red	7,172	1,803	4,676	1,490
Statewide Total	37,096	13,250	37,122	13,138

Pavement Condition by Roadway Class

Table 19 presents the 2016 and 2018 statewide pavement condition based on the Caltrans rating system by roadway classifications. Pavement condition improved for all roadway classes in 2018 compared to 2016.

TABLE 19. STATEWIDE PAVEMENT CONDITION SUMMARY BY ROADWAY CLASSIFICATIONS BASED ON CALTRANS RATING SYSTEM

Roadway Class	2016 Green Lane-Miles	2016 Yellow Lane-Miles	2016 Red Lane-Miles	2016 Sub-Total	2018 Green Lane-Miles	2018 Yellow Lane-Miles	2018 Red Lane-Miles	2018 Sub-Total
Class 1	20,374 (74.9%)	3,906 (14.4%)	2,927 (10.8%)	27,208 (100%)	22,319 (82.2%)	2,918 (10.7%)	1,909 (7.0%)	27,145 (100%)
Class 2	8,143 (49.6%)	4,304 (26.2%)	3,956 (24.1%)	16,403 (100%)	9,517 (58.0%)	4,120 (25.1%)	2,765 (16.9%)	16,403 (100%)
Class 3	2,938 (43.6%)	1,705 (25.3%)	2,091 (31.0%)	6,735 (100%)	3,540 (52.7%)	1,680 (25.0%)	1,492 (22.2%)	6,713 (100%)
Statewide Total	31,455 (62.5%)	9,916 (19.7%)	8,975 (17.8%)	50,346 (100%)	35,376 (70.4%)	8,718 (17.3%)	6,166 (12.3%)	50,261 (100%)

Pavement condition for each district by roadway class based on the Caltrans rating system is available in Appendix D and Appendix E.

Pavement Condition by Highway Type

Table 20 presents the 2016 and 2018 statewide pavement by highway type based on the Caltrans rating system. The pavement condition along the N.H.S. and the Interstate System in California improved in 2018 compared to 2016.

TABLE 20. STATEWIDE PAVEMENT CONDITION SUMMARY BY HIGHWAY TYPE BASED ON CALTRANS RATING SYSTEM

Highway Type	2016 Green Lane-Miles	2016 Yellow Lane-Miles	2016 Red Lane-Miles	2016 Sub-Total	2018 Green Lane-Miles	2018 Yellow Lane-Miles	2018 Red Lane-Miles	2018 Sub-Total
N.H.S – Interstate	11,116 76.8%	1,922 13.3%	1,435 9.9%	14,473 100%	12,177 84.5%	1,274 8.8%	960 6.7%	14,411 100%
N.H.S. – Non-Interstate	14,375 63.2%	4,365 19.2%	4,010 17.6%	22,750 100%	15,827 69.5%	4,249 18.7%	2,690 11.8%	22,765 100%
N.H.S. Sub-Total	25,491 68.5%	6,287 16.9%	5,444 14.6%	37,223 100%	28,004 75.3%	5,523 14.9%	3,649 9.8%	37,176 100%
Non-N.H.S.	5,964 45.4%	3,629 27.7%	3,530 26.9%	13,123 100%	7,373 56.3%	3,195 24.4%	2,517 19.2%	13,085 100%
Statewide Total	31,455 62.5%	9,916 19.7%	8,975 17.8%	50,346 100%	35,376 70.4%	8,718 17.3%	6,166 12.3%	50,261 100%

Pavement Condition by District

Table 21 presents the 2016 and 2018 statewide pavement condition by district based on the Caltrans rating system. Overall, pavement condition improves for 10 out of 12 districts. The exceptions are District 2 and District 8. For District 2, while the lane-miles of *Green* pavement increase and the lane-miles of *Red* pavement decrease, there was a small increase in the lane-miles of *Yellow* pavement. For District 8, the pavement condition went down slightly.

TABLE 21. STATEWIDE PAVEMENT CONDITION SUMMARY BY DISTRICT BASED ON CALTRANS RATING SYSTEM

District	2016 Green Lane-Miles	2016 Yellow Lane-Miles	2016 Red Lane-Miles	2016 Sub-Total	2018 Green Lane-Miles	2018 Yellow Lane-Miles	2018 Red Lane-Miles	2018 Sub-Total
District 1	1,342 (57.3%)	424 (18.1%)	578 (24.6%)	2,343 (100%)	1,514 (65.1%)	365 (15.7%)	447 (19.2%)	2,326 (100%)
District 2	1,790 (45.9%)	1,137 (29.1%)	975 (25.0%)	3,901 (100%)	2,310 (58.2%)	1,278 (32.2%)	381 (9.6%)	3,970 (100%)
District 3	2,605 (58.7%)	1,058 (23.9%)	772 (17.4%)	4,435 (100%)	3,117 (70.2%)	884 (19.9%)	438 (9.9%)	4,439 (100%)
District 4	3,933 (64.0%)	768 (12.5%)	1,440 (23.5%)	6,141 (100%)	4,421 (71.5%)	647 (10.5%)	1,116 (18.1%)	6,184 (100%)
District 5	1,603 (50.1%)	834 (26.1%)	760 (23.8%)	3,197 (100%)	1,862 (58.7%)	745 (23.5%)	568 (17.9%)	3,175 (100%)
District 6	3,389 (66.9%)	1,071 (21.1%)	605 (12.0%)	5,068 (100%)	3,538 (69.5%)	967 (19.0%)	589 (11.6%)	5,095 (100%)
District 7	3,767 (59.7%)	886 (14.1%)	1,651 (26.2%)	6,304 (100%)	4,514 (72.2%)	666 (10.6%)	1,075 (17.2%)	6,255 (100%)
District 8	4,858 (72.5%)	1,086 (16.2%)	756 (11.3%)	6,700 (100%)	4,771 (71.6%)	1,132 (17.0%)	759 (11.4%)	6,663 (100%)
District 9	1,582 (62.7%)	672 (26.6%)	270 (10.7%)	2,524 (100%)	1,789 (69.8%)	658 (25.7%)	116 (4.5%)	2,563 (100%)
District 10	2,160 (61.3%)	760 (21.6%)	602 (17.1%)	3,522 (100%)	2,479 (70.4%)	738 (21.0%)	302 (8.6%)	3,520 (100%)
District 11	2,929 (69.7%)	907 (21.6%)	364 (8.7%)	4,200 (100%)	3,385 (82.6%)	475 (11.6%)	238 (5.8%)	4,097 (100%)
District 12	1,498 (74.5%)	314 (15.6%)	198 (9.9%)	2,010 (100%)	1,676 (84.8%)	163 (8.2%)	138 (7.0%)	1,976 (100%)
Statewide Total	31,455 (62.5%)	9,916 (19.7%)	8,975 (17.8%)	50,346 (100%)	35,376 (70.4%)	8,718 (17.3%)	6,166 (12.3%)	50,261 (100%)

PAVEMENT ROUGHNESS

Pavement Roughness Statewide

Pavement roughness can be considered as a correlation of surface ride quality and the level of comfort that people experience while traveling along the roadway. Since the early 1990s, pavement roughness has been an important metric for the Federal Highway Administration (F.H.W.A.). Both the F.H.W.A. and Caltrans included I.R.I. as a pavement performance criterion. It is undesirable for I.R.I. to exceed 170 inches per mile. Figure 5 presents the 2016 and 2018 statewide I.R.I. distribution percentage. Green represents pavement with I.R.I. less than 95 inches per mile, yellow represents pavement with I.R.I. between 95 to 170 inches per mile, and blue represents pavement with I.R.I. greater than 170 inches per mile. Overall, there was less pavement with I.R.I. greater than 170 inches per mile in 2018 compared to 2016.

FIGURE 5. STATEWIDE I.R.I. DISTRIBUTION PERCENTAGE

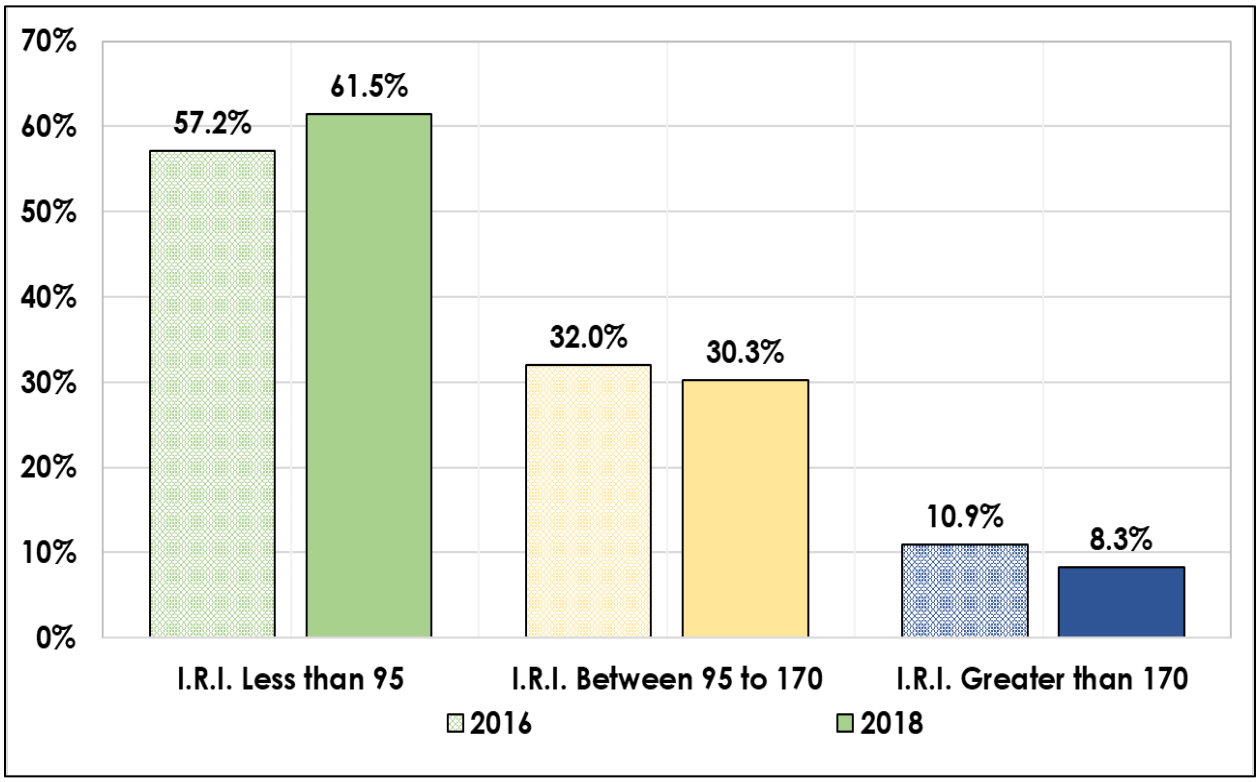
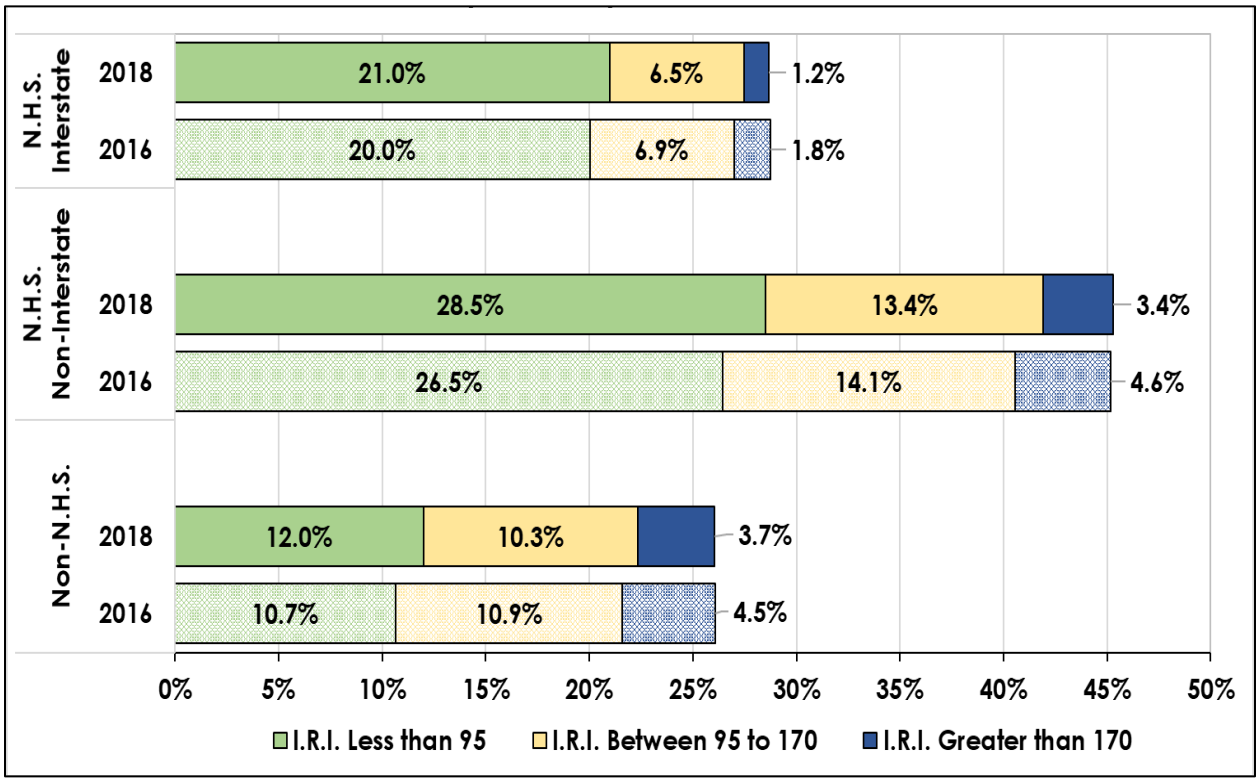


Figure 6 presents the 2016 and 2018 statewide I.R.I. distribution percentage by highway type. The percentage of lane-miles with I.R.I. greater than 170 inches per mile decreased for all highway types in 2018 compared to 2016.

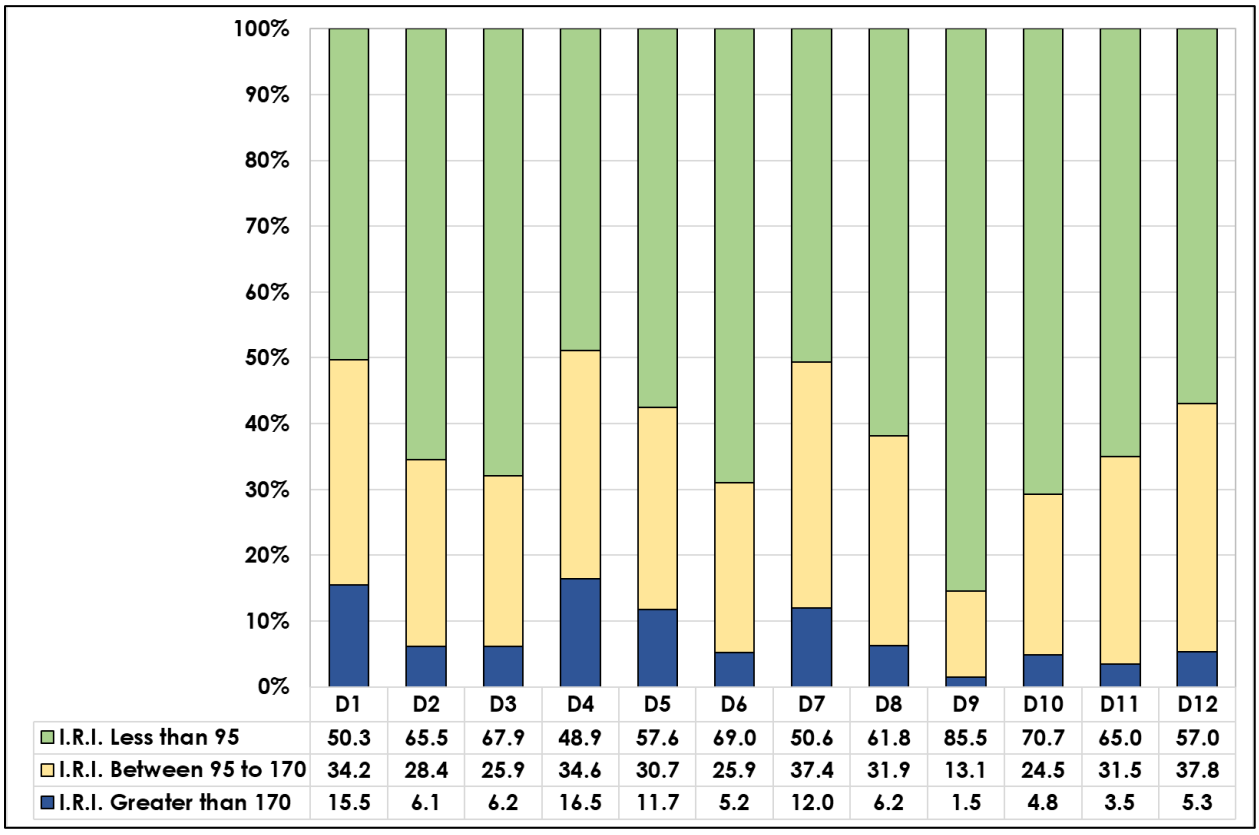
FIGURE 6. STATEWIDE I.R.I. DISTRIBUTION PERCENTAGE BY HIGHWAY TYPE



Pavement Roughness by District

Figure 7 presents the 2018 statewide I.R.I. distribution percentage by district.

FIGURE 7. 2018 STATEWIDE I.R.I. DISTRIBUTION PERCENTAGE BY DISTRICT



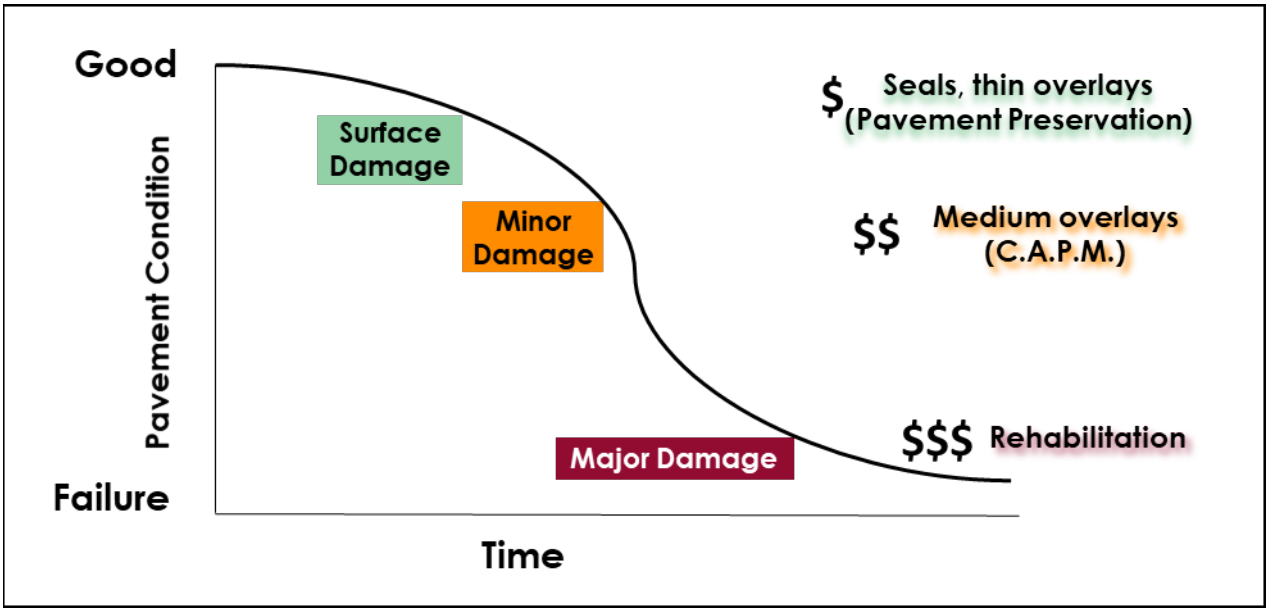
	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12
I.R.I. Less than 95	50.3	65.5	67.9	48.9	57.6	69.0	50.6	61.8	85.5	70.7	65.0	57.0
I.R.I. Between 95 to 170	34.2	28.4	25.9	34.6	30.7	25.9	37.4	31.9	13.1	24.5	31.5	37.8
I.R.I. Greater than 170	15.5	6.1	6.2	16.5	11.7	5.2	12.0	6.2	1.5	4.8	3.5	5.3

I.R.I. distribution for each district by highway type is available in Appendix F and Appendix G.

PAVEMENT TREATMENT STRATEGIES

Pavement deterioration can be represented graphically by a sigmoid curve where the rate will be slow initially before exponentially accelerating until the pavement reaches failure. By applying timely preventive treatments, Caltrans can extend the service life of the pavement and delay the need to apply more costly treatments in the future. For example, pavement preventive maintenance costs an average of $150,000 per lane-mile, while major pavement rehabilitation would cost eight times higher or more. Figure 8 presents a typical pavement deterioration curve and the potential management strategies for each phase of the pavement's service life.

FIGURE 8. ILLUSTRATION OF COST EFFECTIVENESS OF PAVEMENT STRATEGIES



Since pavement naturally deteriorates over time, preventive and corrective treatments may still be applicable for locations in relatively good condition. This ensures that the pavement will remain in a state of good repair. Studies have shown that preventive and corrective maintenance treatments can extend a pavement's service life by four to seven years depending on traffic volumes and environmental conditions. Preventive and corrective treatments include H.M.A. thin overlay, chip seal, slurry seal, dig-out, concrete grinding, and concrete slab replacement. These treatments would be completed as a part of the H.M.1 projects.

Capital Preventive Maintenance (C.A.P.M.) projects are typically applied to pavement with minor structural and poor I.R.I. pavement distresses. C.A.P.M. treatments can extend the service life by five to ten years. Treatment strategies

include concrete grinding, concrete slab replacement, and H.M.A. medium overlay.

Major pavement rehabilitation is the most expensive type of treatment because it typically applies to locations with extensive existing structural distress. Rather than just surface repairs, major pavement rehabilitation requires a comprehensive pavement structure design engineered for future traffic loads over a 20- or 40-year service life. Rehabilitation strategies include J.P.C.P. or C.R.C.P. lane replacement, full-depth reclamation, and H.M.A. thick overlays with a thickness greater than 0.25-foot.

Table 22 provides the average costs for the three primary funding programs for pavement treatment from F.Y. 2015/16 through F.Y. 2017/18. Additional details for various treatments within each program are available in Appendix H to Appendix J.

TABLE 22. AVERAGE COST PER LANE-MILE FOR DIFFERENT FUNDING PROGRAMS FROM F.Y. 2015/16 THROUGH F.Y. 2017/18

Funding Program	Cost per Lane-Mile	Expected Service Life
H.M.1 (Preventive and Corrective Maintenance)	$152,000	Four to seven years
C.A.P.M.	$301,000	Five to 10 years
Major Rehabilitation	$1,151,000	20 or more years

PAVEMENT EXPENDITURES AND FINANCIAL PLAN

Caltrans keeps track of awarded pavement projects as a part of its fiduciary responsibility. The information also allows Caltrans to extrapolate and plan for future pavement distresses based on the expected service life of the applied treatments. Table 23 summarizes the total capital costs and lane-miles for H.M.1 and S.H.O.P.P. pavement improvements from F.Y. 2015/16 through F.Y. 2017/18. As Caltrans applies asset management principles into its project planning, programming, and delivery, pavement treatments are now being incorporated into projects that include work for other roadway features as well. As a result, the costs presented in Table 23 have been filtered for pavement-related contract bid items only. Project support costs were also excluded from the analysis.

TABLE 23. AWARDED PAVEMENT IMPROVEMENTS CAPITAL COSTS AND LANE-MILES FROM F.Y. 2015/16 TO F.Y. 2017/18

Project Type	F.Y. 2015/16 Million Dollar[3]	F.Y. 2015/16 Lane-Miles	F.Y. 2016/17 Million Dollar[3]	F.Y. 2016/17 Lane-Miles	F.Y. 2017/18 Million Dollar[3]	F.Y. 2017/18 Lane-Miles	Total Million Dollar[3]	Total Lane-Miles
H.M.1	$219	1,808	$192	1,570	$482	2,488	$893	5,866
S.H.O.P.P. – C.A.P.M.	$353	1,312	$237	705	$290	907	$880	2,924
S.H.O.P.P. – Rehabilitation	$350	365	$457	376	$282	205	$1,089	946
S.H.O.P.P. – Minor A	$7	18	$1	6	$2	7	$10	31
S.H.O.P.P. – Sub-Total	$710	1,695	$695	1,087	$574	1,118	$1,979	3,900
Total H.M.1 and S.H.O.P.P.	$929	3,503	$887	2,657	$1,056	3,606	$2,872	9,766

From F.Y. 2015/16 through F.Y. 2017/18, Caltrans delivered approximately $2.9 Billion in pavement projects on nearly 9,800 lane-miles of roadway. In F.Y. 2017/18, Caltrans delivered an additional $200 Million of H.M.1 pavement projects with funding from the Road Maintenance and Rehabilitation Program authorized under Senate Bill 1 (2017-2018). This allowed Caltrans to accelerate

[3] Costs associated to pavement-related contract bid items only and exclude project support costs. Does not include on-call maintenance contracts or Director's Order contracts.

and complete roadway maintenance projects that would have been deferred as a result of limited funding from the existing State Highway Account. Figure 9 presents a graph of the awarded pavement improvements capital costs and numbers of lane-miles for the three primary funding programs from F.Y. 2015/16 through F.Y. 2017/18.

FIGURE 9. AWARDED PAVEMENT IMPROVEMENTS CAPITAL COSTS AND LANE-MILES FROM F.Y. 2015/16 TO F.Y. 2017/18

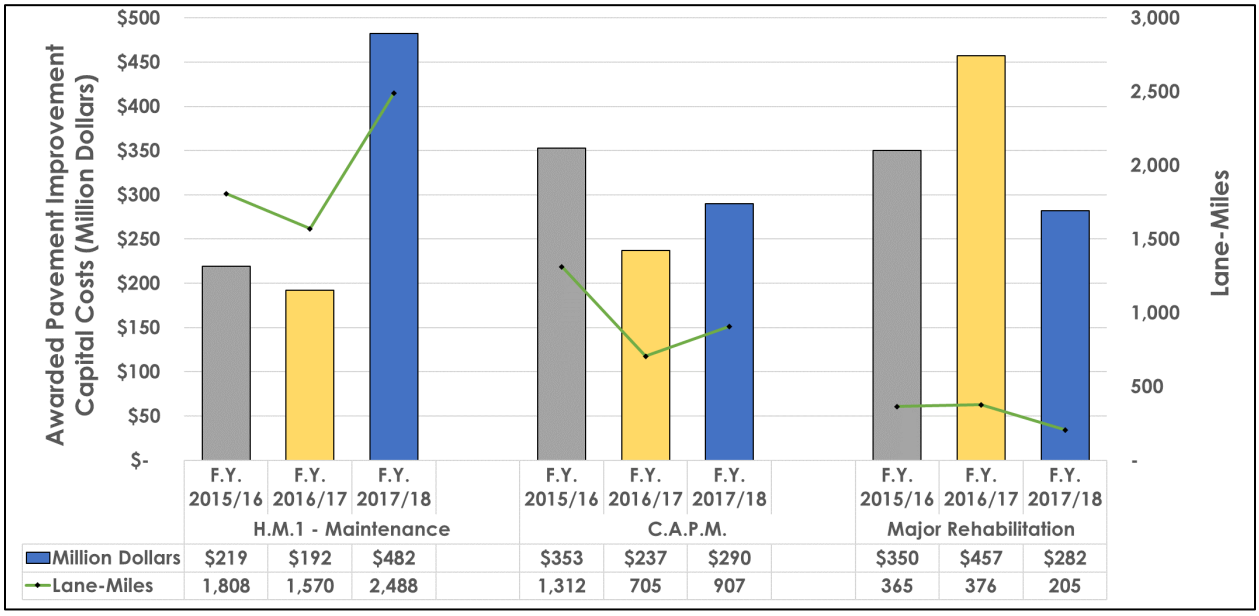


Figure 10 presents a detailed distribution of the pavement treatment strategies utilized in F.Y. 2015/16 for H.M.1 projects based on the awarded amount. H.M.A. thin overlay for asphalt concrete accounted for a combined 49 percent of the total awarded amounts. At 13 percent, mill and fill was the second most awarded amount. At 12 percent, chip seal was the third most awarded amount. At a combined three percent, slab replacement accounted for the most awarded amount for concrete pavement.

Figure 11 presents a detailed distribution of the pavement treatment strategies utilized in F.Y. 2015/16 for C.A.P.M. projects based on the awarded amount. H.M.A. medium overlay for asphalt concrete accounted for 45 percent of the total awarded amount, while grind/replace slabs for concrete pavement accounted for 25 percent.

Figure 12 presents a detailed distribution of the pavement treatment strategies utilized in F.Y. 2015/16 for major rehabilitation projects based on the awarded amount. C.R.C.P. lane replacement for concrete pavement accounted for 41 percent of the total awarded amount, while H.M.A. thick overlay for asphalt pavement accounted for 27 percent.

FIGURE 10. F.Y. 2015/16 H.M.1 PREVENTIVE AND CORRECTIVE MAINTENANCE STRATEGIES

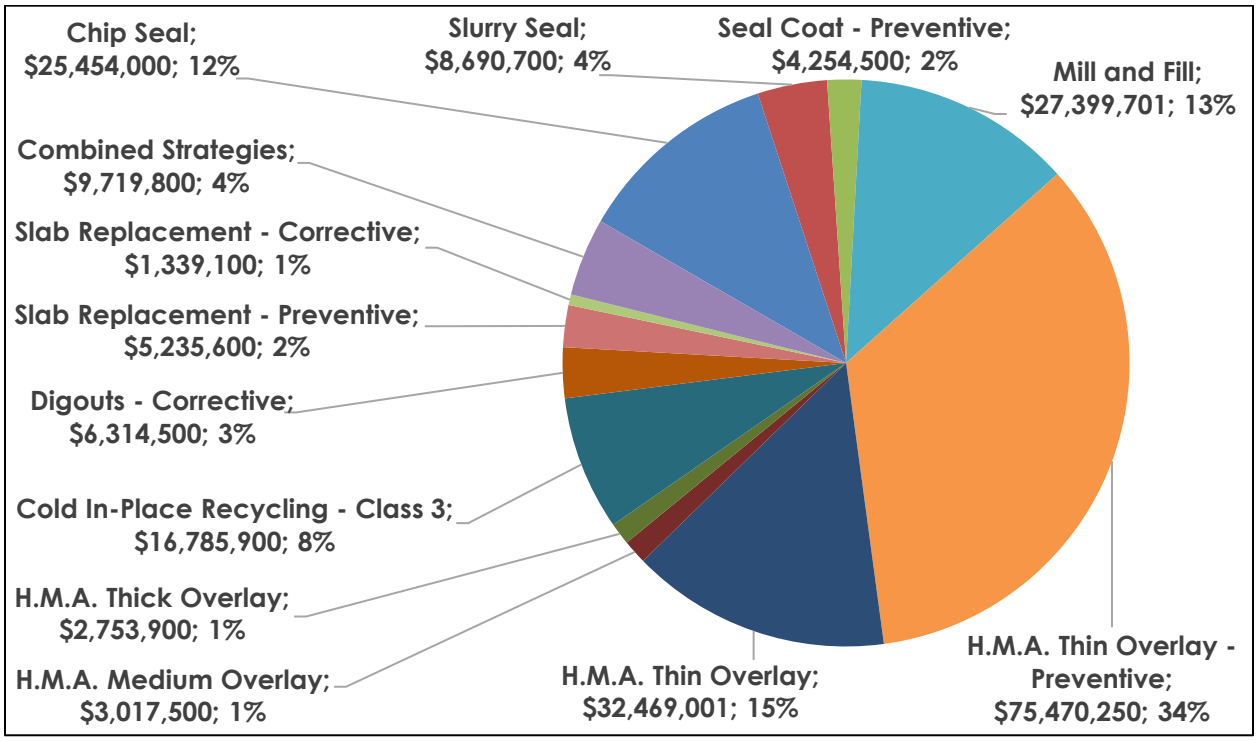


FIGURE 11. F.Y. 2015/16 C.A.P.M. STRATEGIES

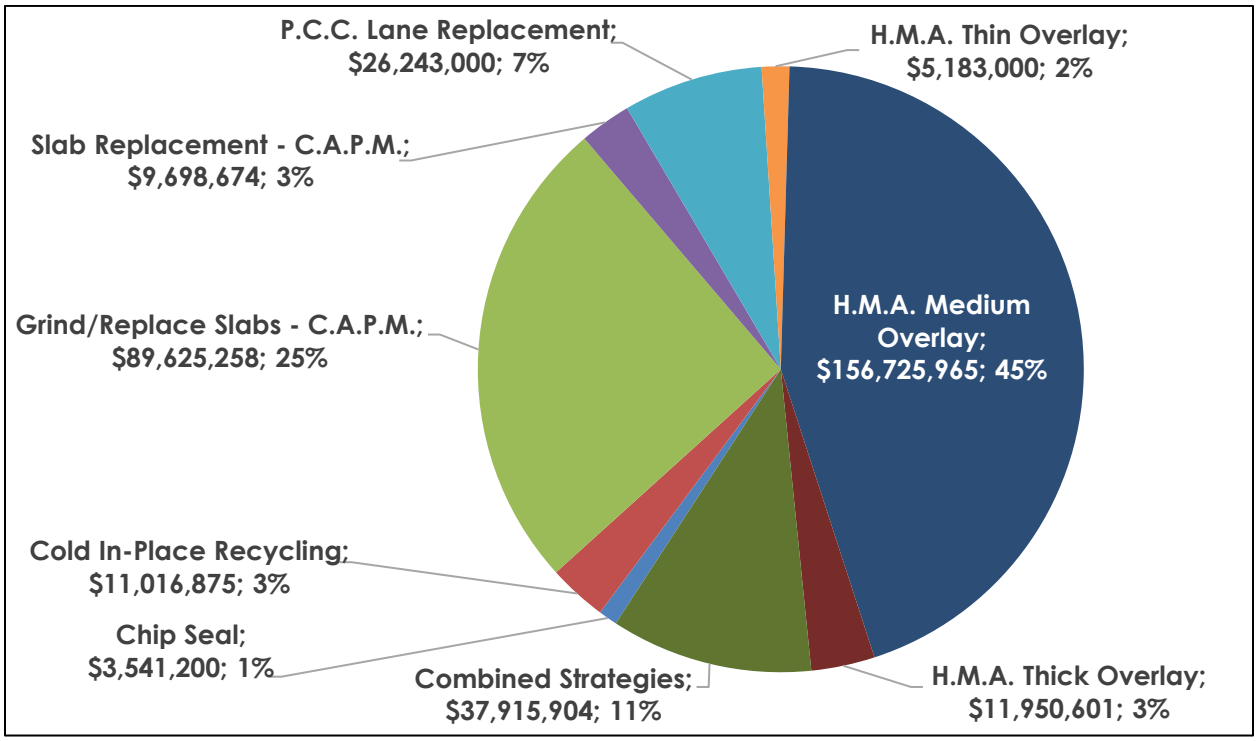


FIGURE 12. F.Y. 2015/16 MAJOR REHABILITATION STRATEGIES

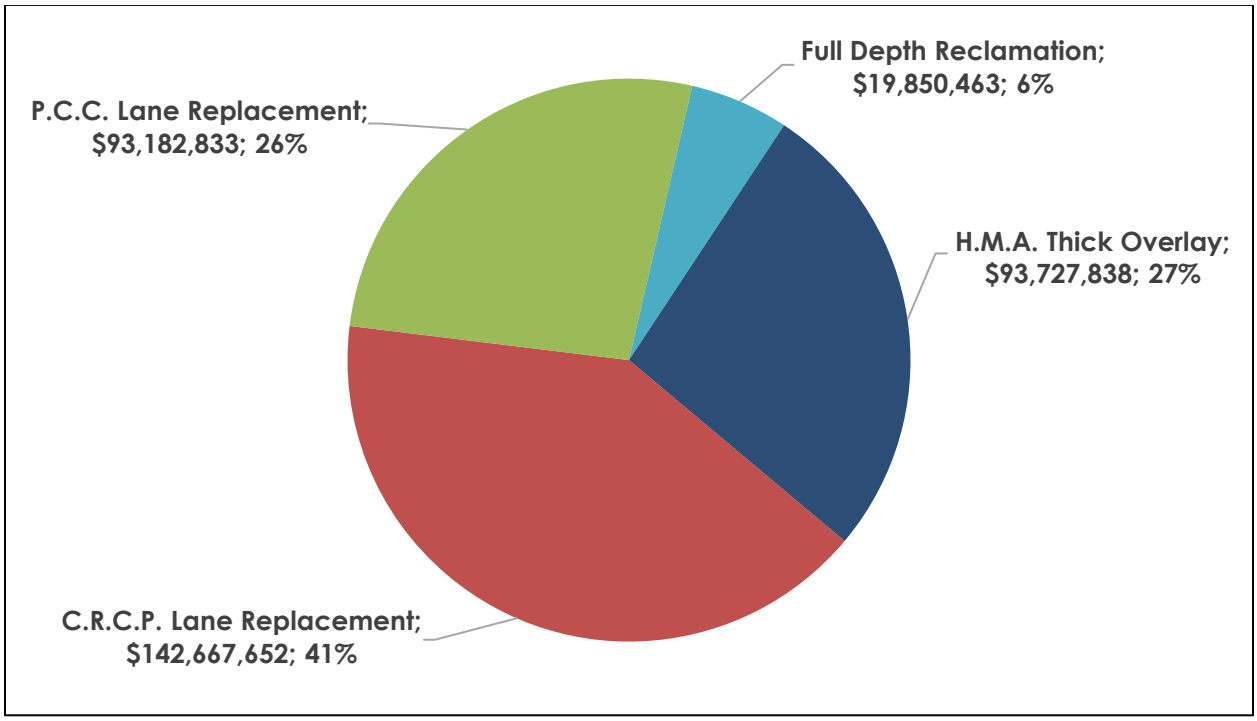


Figure 13 presents a detailed distribution of the pavement treatment strategies utilized in F.Y. 2016/17 for H.M.1 projects based on the awarded amount. H.M.A. thin overlay for asphalt concrete accounted for a combined 62 percent of the total awarded amount. At 12 percent, chip seal was the second most awarded amount. At seven percent, grinding accounted for the most awarded amount for concrete pavement.

Figure 14 presents a detailed distribution of the pavement treatment strategies utilized in F.Y. 2016/17 for C.A.P.M. projects based on the awarded amount. Most of the funding was allocated to improving asphalt pavement. H.M.A. medium overlay accounted for 73 percent of the total awarded amount. At four percent, grind/replace slabs accounted for the most awarded amount for concrete pavement.

Figure 15 presents a detailed distribution of the pavement treatment strategies utilized in F.Y. 2016/17 for major rehabilitation projects based on the awarded amount. Most of the funding was allocated to replacing concrete pavement with 31 percent of the total awarded amount for P.C.C. lane replacement and 28 percent for C.R.C.P. lane replacement. H.M.A. thick overlay for asphalt pavement accounted for 36 percent of the total awarded amount.

FIGURE 13. F.Y. 2016/17 H.M.1 PREVENTIVE AND CORRECTIVE MAINTENANCE STRATEGIES

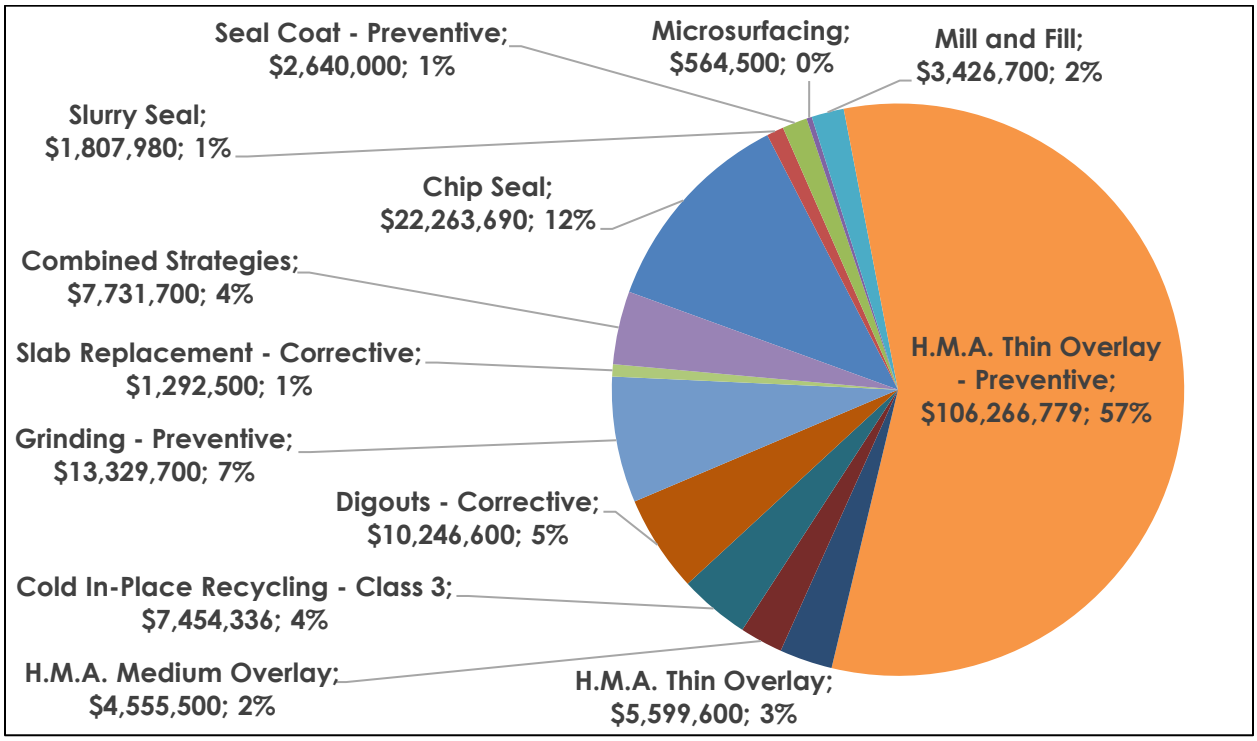


FIGURE 14. F.Y. 2016/17 C.A.P.M. STRATEGIES

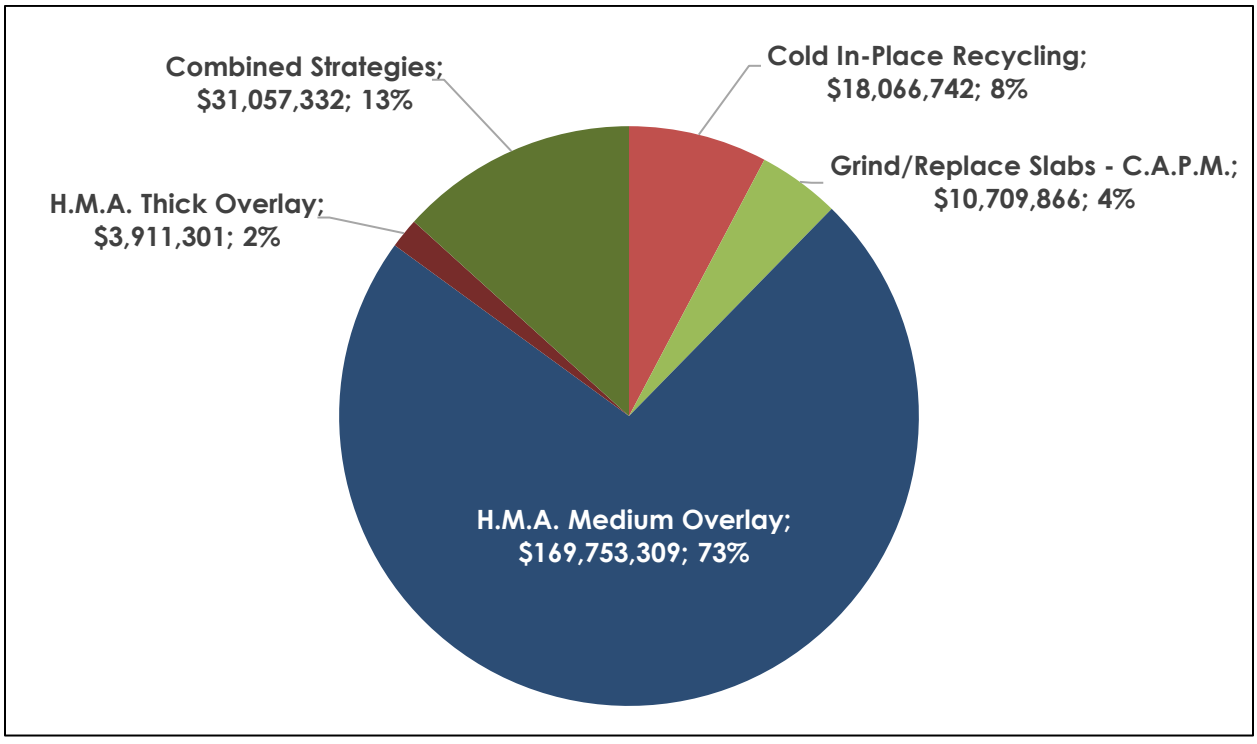


FIGURE 15. F.Y. 2016/17 MAJOR REHABILITATION STRATEGIES

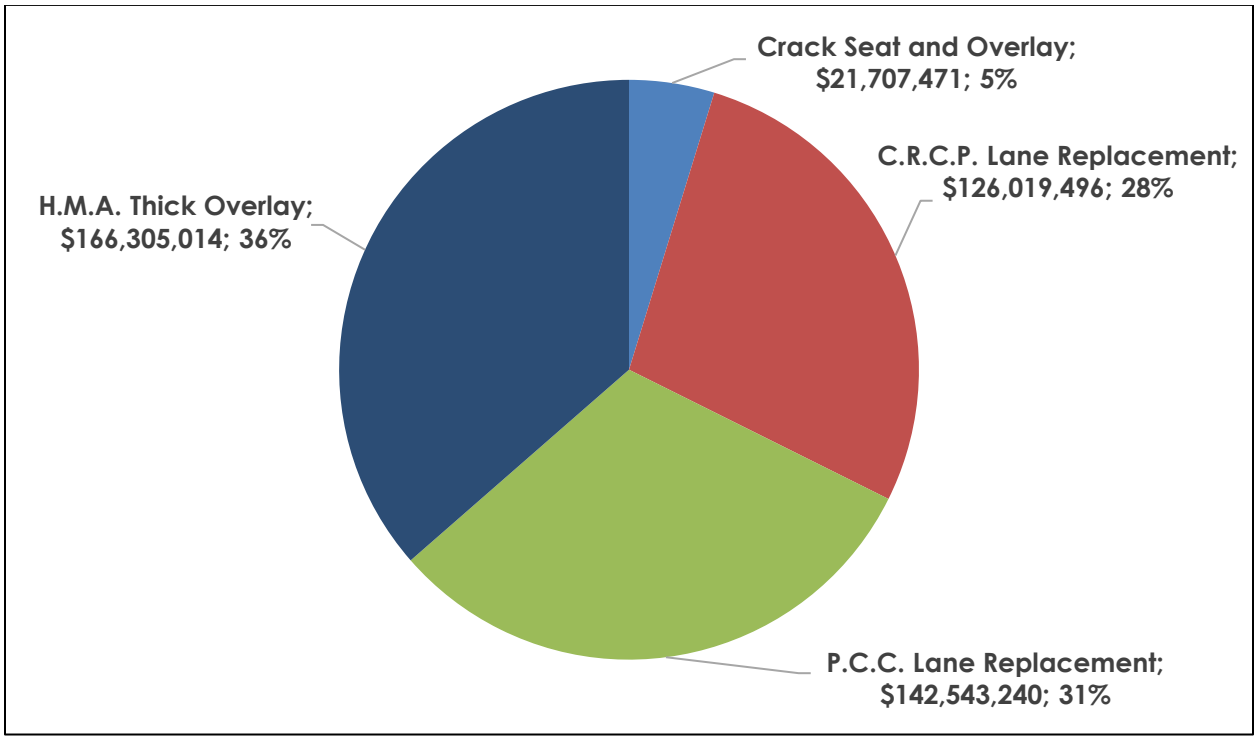


Figure 16 presents a detailed distribution of the pavement treatment strategies utilized in F.Y. 2017/18 for H.M.1 projects based on the awarded amount. As mentioned previously, Caltrans awarded an additional $200 Million of H.M.1 pavement projects in F.Y. 2017/18 with funding from the Road Maintenance and Rehabilitation Program. This enabled Caltrans to apply more H.M.A. medium overlay this year than in previous years as the treatment can provide a longer expected service life than a thin overlay. While H.M.A. medium overlay accounted for 39 percent of the total awarded amount, H.M.A. thin overlay was the second most awarded amount at a combined total of 36 percent. At five percent, slab replacement accounted for the most awarded amount for concrete pavement.

Figure 17 presents a detailed distribution of the pavement treatment strategies utilized in F.Y. 2017/18 for C.A.P.M. projects based on the awarded amount. Most of the funding was allocated to improving asphalt pavement. H.M.A. medium overlay accounted for 76 percent of the total awarded amount. Grind/replace slabs for concrete pavement was the second highest total awarded amount, accounting for 18 percent.

Figure 18 presents a detailed distribution of the pavement treatment strategies utilized in F.Y. 2017/18 for major rehabilitation projects based on the awarded

amount. Most of the funding was allocated to replacing concrete pavement with 32 percent of the total awarded amount for C.R.C.P. lane replacement and 13 percent for P.C.C. lane replacement. H.M.A. thick overlay for asphalt pavement accounted for 19 percent of the total awarded amount.

FIGURE 16. F.Y. 2017/18 H.M.1 PREVENTIVE AND CORRECTIVE MAINTENANCE STRATEGIES

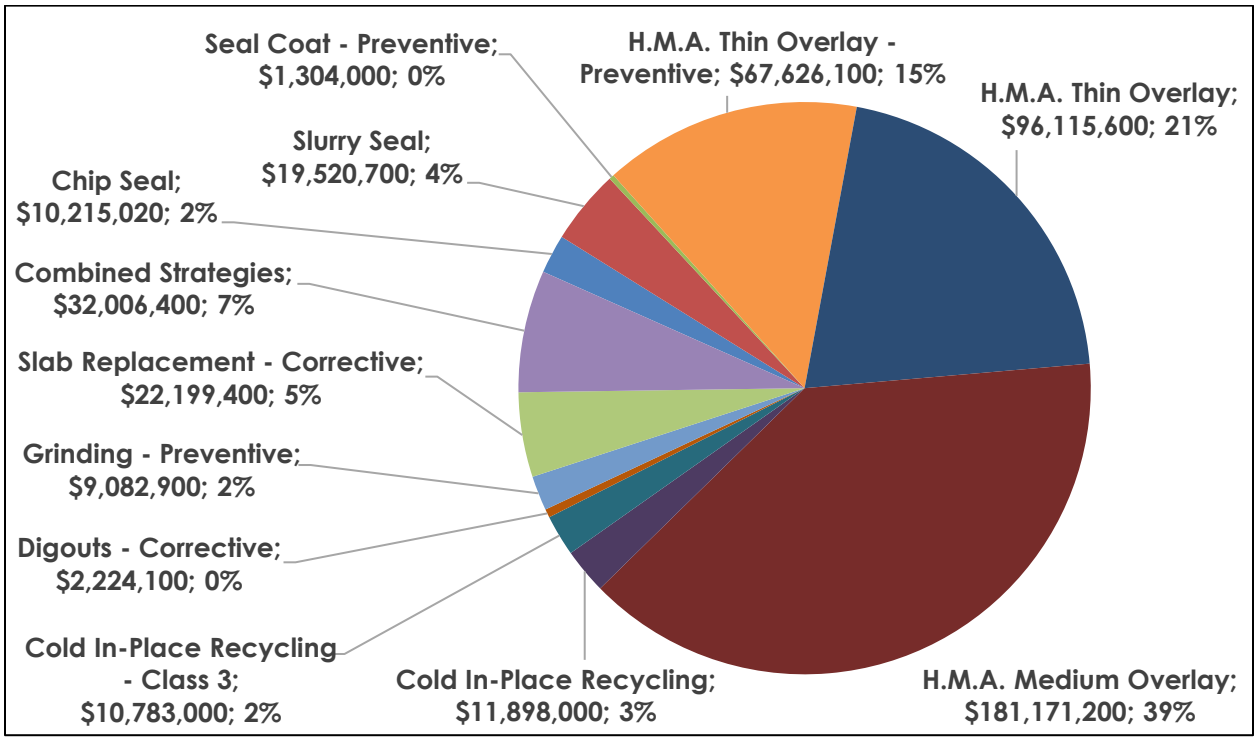


FIGURE 17. F.Y. 2017/18 C.A.P.M. STRATEGIES

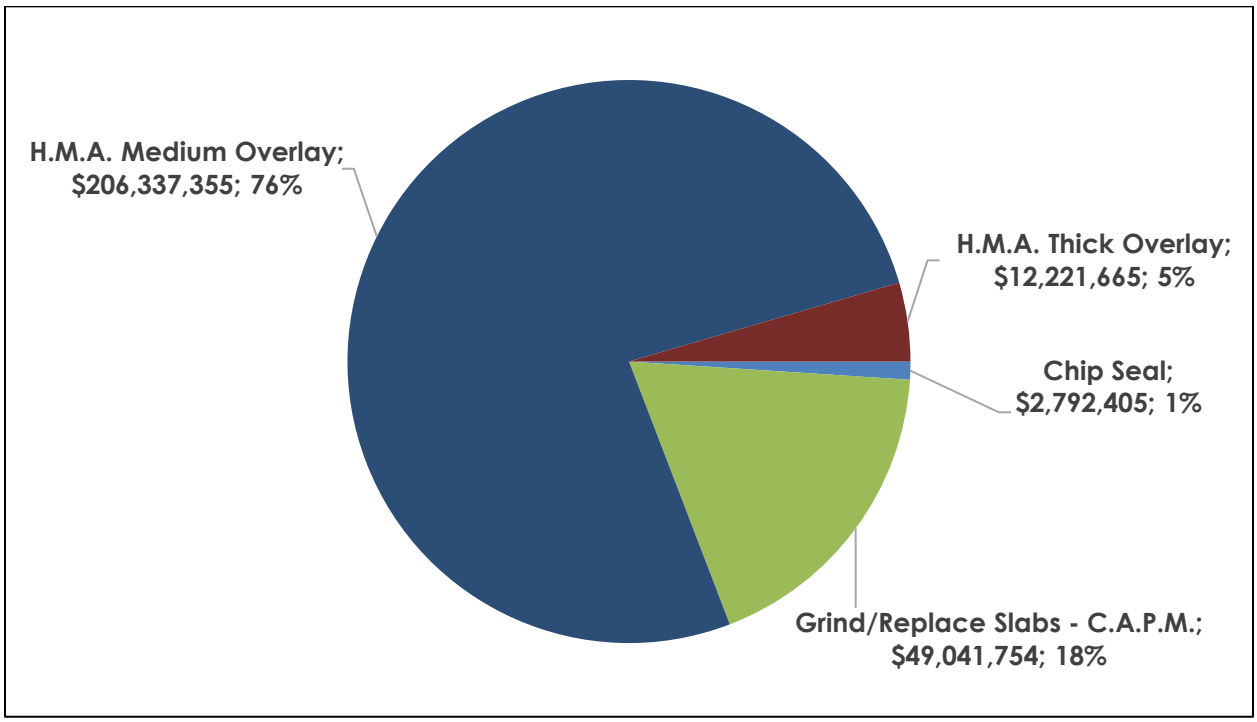


FIGURE 18. F.Y. 2017/18 MAJOR REHABILITATION STRATEGIES

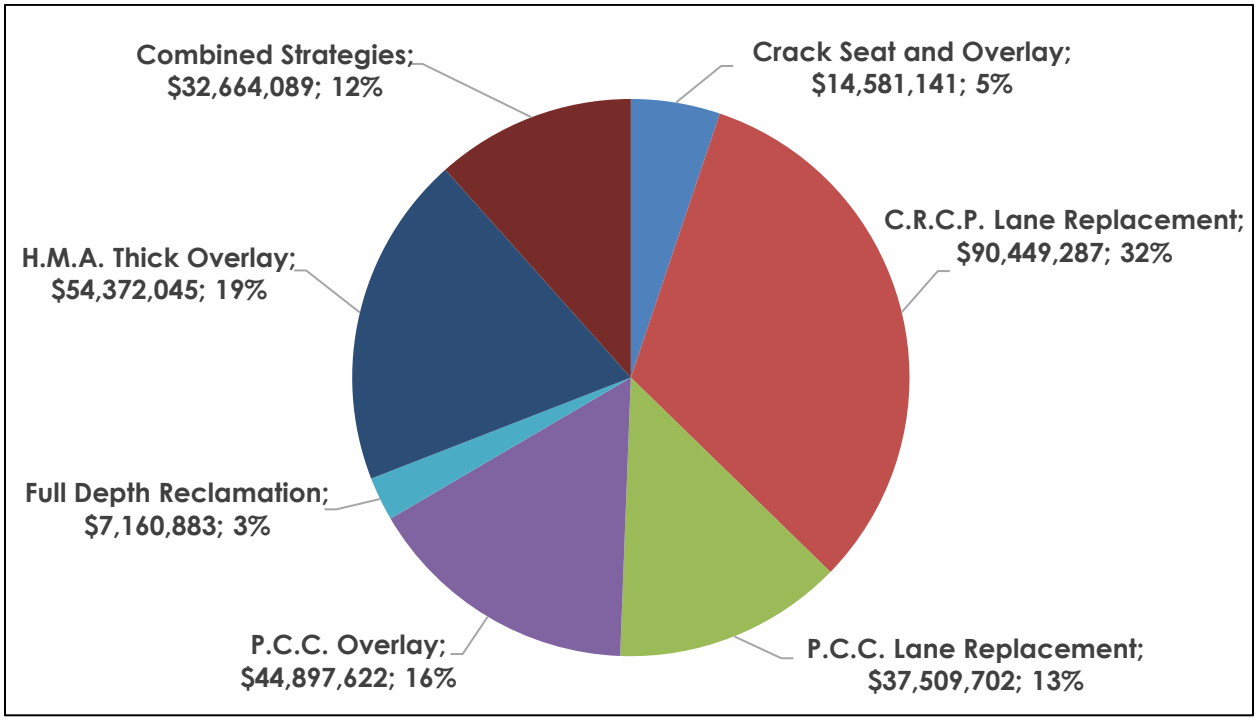
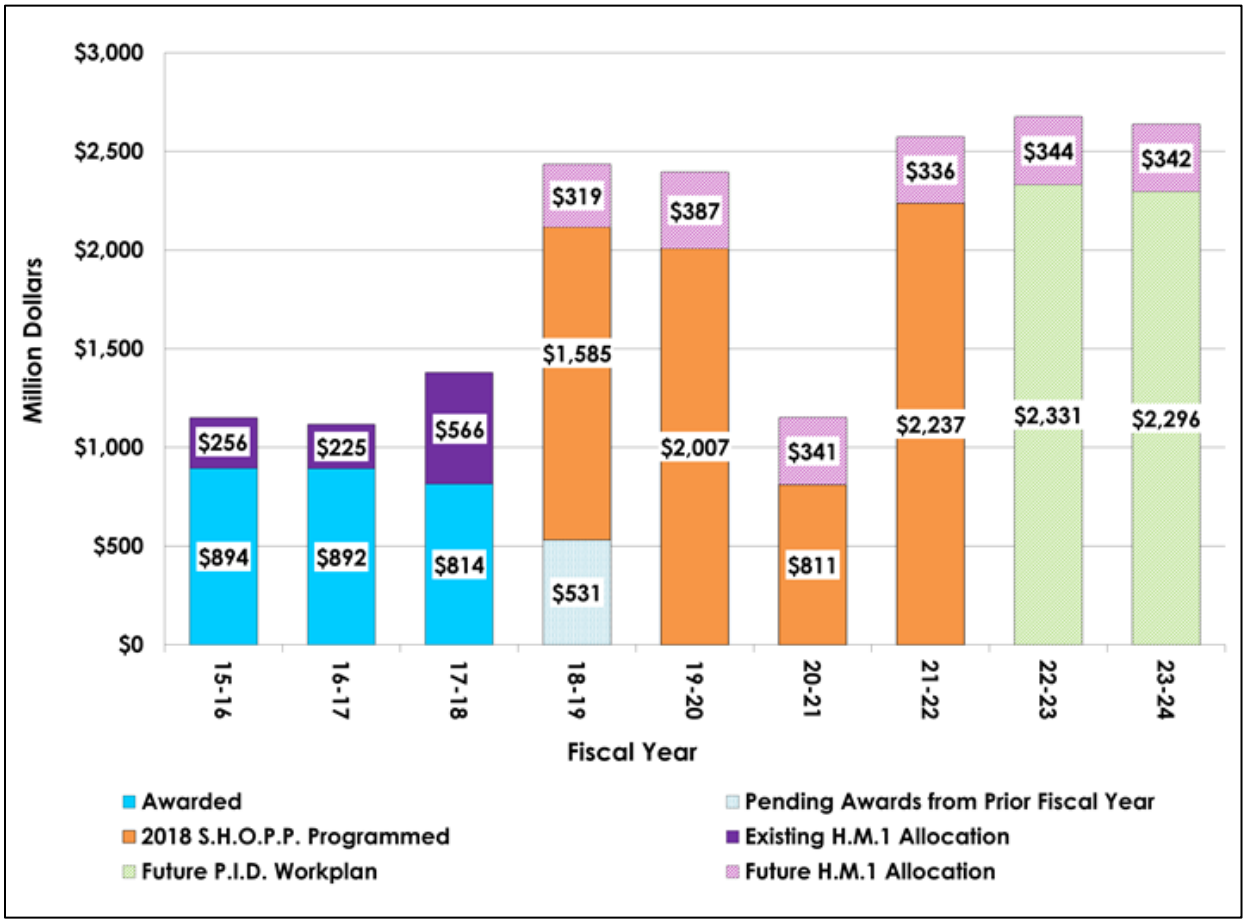


Figure 19 presents the financial plan for pavement improvements. It consists of existing expenditures as of the end of F.Y. 2017/18 and anticipated future expenditures for F.Y. 2018/19 and beyond. While the plan primarily focuses on pavement improvement projects, they may include work for other roadway features as Caltrans is committed to aligning its funding to effectively manage all of its assets. The dollar amounts represent project capital (excluding right-of-way) and support costs that would be accrued as of the Ready-to-List date for construction contract advertisement. Existing expenditures include S.H.O.P.P. projects that have been awarded and annual H.M.1 allocations. Future expenditures include programmed projects from the prior fiscal year that have not been awarded, approved projects from the 2018 S.H.O.P.P. plan to be programmed for F.Y. 2018/19 through F.Y. 2021/22, future H.M.1 allocations, and future projects that have been identified in the S.H.O.P.P. Project Initiation Document (P.I.D.) Workplan for F.Y. 2022/23 through F.Y. 2023/24.

FIGURE 19. FINANCIAL PLAN FOR PAVEMENT IMPROVEMENTS



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APPENDIX A – CALTRANS DISTRICT BOUNDARY MAP

APPENDIX B – 2018 PAVEMENT CONDITION BY DISTRICT AND ROADWAY CLASSIFICATION BASED ON FEDERAL PAVEMENT PERFORMANCE MEASURES

TABLE 24. 2018 PAVEMENT CONDITION BASED ON FEDERAL PAVEMENT PERFORMANCE MEASURES

District	Class 1 Good	Class 2 Good	Class 3 Good	Class 1 Fair	Class 2 Fair	Class 3 Fair	Class 1 Poor	Class 2 Poor	Class 3 Poor	Sub-Total
District 1	705 (30.3%)	318 (13.7%)	101 (4.4%)	341 (14.6%)	412 (17.7%)	436 (18.8%)	4 (0.2%)	1 (0.0%)	8 (0.3%)	2,326 (100%)
District 2	850 (21.4%)	1,051 (26.5%)	468 (11.8%)	138 (3.5%)	739 (18.6%)	685 (17.3%)	1 (0.0%)	18 (0.5%)	21 (0.5%)	3,970 (100%)
District 3	1,224 (27.6%)	1,152 (26.0%)	228 (5.1%)	630 (14.2%)	716 (16.1%)	456 (10.3%)	10 (0.2%)	7 (0.1%)	16 (0.4%)	4,439 (100%)
District 4	2,175 (35.2%)	487 (7.9%)	32 (0.5%)	1,540 (24.9%)	1,523 (24.6%)	327 (5.3%)	62 (1.0%)	33 (0.5%)	6 (0.1%)	6,184 (100%)
District 5	933 (29.4%)	641 (20.2%)	139 (4.4%)	285 (9.0%)	643 (20.2%)	500 (15.7%)	9 (0.3%)	14 (0.4%)	10 (0.3%)	3,175 (100%)
District 6	1,570 (30.8%)	864 (17.0%)	840 (16.5%)	486 (9.5%)	755 (14.8%)	539 (10.6%)	26 (0.5%)	5 (0.1%)	10 (0.2%)	5,095 (100%)
District 7	2,230 (35.6%)	364 (5.8%)	54 (0.9%)	2,204 (35.2%)	1,085 (17.3%)	175 (2.8%)	120 (1.9%)	23 (0.4%)	0 (0.0%)	6,255 (100%)
District 8	2,916 (43.8%)	701 (10.5%)	143 (2.1%)	1,626 (24.4%)	999 (15.0%)	172 (2.6%)	90 (1.3%)	14 (0.2%)	1 (0.0%)	6,663 (100%)
District 9	1,338 (52.2%)	462 (18.0%)	264 (10.3%)	206 (8.0%)	133 (5.2%)	155 (6.1%)	4 (0.1%)	0 (0.0%)	0 (0.0%)	2,563 (100%)
District 10	1,003 (28.5%)	957 (27.2%)	400 (11.4%)	248 (7.1%)	694 (19.7%)	185 (5.3%)	14 (0.4%)	16 (0.4%)	1 (0.0%)	3,520 (100%)
District 11	1,897 (46.3%)	369 (9.0%)	185 (4.5%)	796 (19.4%)	685 (16.7%)	154 (3.8%)	4 (0.1%)	7 (0.2%)	0 (0.0%)	4,097 (100%)
District 12	818 (41.4%)	176 (8.9%)	0 (0.0%)	636 (32.2%)	338 (17.1%)	1 (0.1%)	6 (0.3%)	2 (0.1%)	0 (0.0%)	1,976 (100%)
Statewide Total	17,659 (35.1%)	7,543 (15.0%)	2,854 (5.7%)	9,138 (18.2%)	8,720 (17.4%)	3,786 (7.5%)	349 (0.7%)	140 (0.3%)	72 (0.1%)	50,261 (100%)

APPENDIX C – 2016 PAVEMENT CONDITION BY DISTRICT AND ROADWAY CLASSIFICATION BASED ON FEDERAL PAVEMENT PERFORMANCE MEASURES

TABLE 25. 2016 PAVEMENT CONDITION BASED ON FEDERAL PAVEMENT PERFORMANCE MEASURES

District	Class 1 Good	Class 2 Good	Class 3 Good	Class 1 Fair	Class 2 Fair	Class 3 Fair	Class 1 Poor	Class 2 Poor	Class 3 Poor	Sub-Total
District 1	622 (26.5%)	292 (12.5%)	75 (3.2%)	439 (18.7%)	430 (18.4%)	464 (19.8%)	2 (0.1%)	11 (0.5%)	8 (0.3%)	2,343 (100%)
District 2	656 (16.8%)	868 (22.3%)	329 (8.4%)	276 (7.1%)	887 (22.7%)	802 (20.6%)	7 (0.2%)	33 (0.8%)	44 (1.1%)	3,901 (100%)
District 3	1,177 (26.5%)	1,097 (24.7%)	171 (3.9%)	673 (15.2%)	760 (17.1%)	500 (11.3%)	12 (0.3%)	19 (0.4%)	27 (0.6%)	4,435 (100%)
District 4	2,007 (32.7%)	406 (6.6%)	32 (0.5%)	1,643 (26.8%)	1,608 (26.2%)	327 (5.3%)	77 (1.3%)	36 (0.6%)	6 (0.1%)	6,141 (100%)
District 5	841 (26.3%)	493 (15.4%)	124 (3.9%)	377 (11.8%)	814 (25.5%)	518 (16.2%)	11 (0.3%)	9 (0.3%)	8 (0.3%)	3,197 (100%)
District 6	1,471 (29.0%)	767 (15.1%)	771 (15.2%)	582 (11.5%)	821 (16.2%)	608 (12.0%)	30 (0.6%)	7 (0.1%)	10 (0.2%)	5,068 (100%)
District 7	1,887 (29.9%)	256 (4.1%)	9 (0.1%)	2,548 (40.4%)	1,188 (18.8%)	220 (3.5%)	154 (2.4%)	41 (0.7%)	0 (0.0%)	6,304 (100%)
District 8	2,781 (41.5%)	628 (9.4%)	145 (2.2%)	1,802 (26.9%)	1,070 (16.0%)	181 (2.7%)	77 (1.1%)	16 (0.2%)	1 (0.0%)	6,700 (100%)
District 9	1,252 (49.6%)	353 (14.0%)	227 (9.0%)	291 (11.5%)	225 (8.9%)	172 (6.8%)	3 (0.1%)	0 (0.0%)	1 (0.0%)	2,524 (100%)
District 10	819 (23.3%)	673 (19.1%)	345 (9.8%)	427 (12.1%)	961 (27.3%)	234 (6.6%)	17 (0.5%)	41 (1.2%)	4 (0.1%)	3,522 (100%)
District 11	1,462 (34.8%)	345 (8.2%)	185 (4.4%)	1,289 (30.7%)	721 (17.2%)	182 (4.3%)	10 (0.2%)	6 (0.1%)	1 (0.0%)	4,200 (100%)
District 12	707 (35.2%)	155 (7.7%)	0 (0.0%)	772 (38.4%)	366 (18.2%)	1 (0.0%)	6 (0.3%)	2 (0.1%)	0 (0.0%)	2,010 (100%)
Statewide Total	15,682 (31.1%)	6,331 (12.6%)	2,413 (4.8%)	11,120 (22.1%)	9,851 (19.6%)	4,210 (8.4%)	406 (0.8%)	222 (0.4%)	112 (0.2%)	50,346 (100%)

TABLE 26. 2018 PAVEMENT CONDITION BASED ON CALTRANS PAVEMENT RATING SYSTEM

District	Class 1 Green	Class 2 Green	Class 3 Green	Class 1 Yellow	Class 2 Yellow	Class 3 Yellow	Class 1 Red	Class 2 Red	Class 3 Red	Sub-Total
District 1	801 (34.5%)	465 (20.0%)	248 (10.6%)	176 (7.6%)	121 (5.2%)	68 (2.9%)	72 (3.1%)	146 (6.3%)	229 (9.9%)	2,326 (100%)
District 2	838 (21.1%)	933 (23.5%)	539 (13.6%)	134 (3.4%)	740 (18.7%)	404 (10.2%)	17 (0.4%)	134 (3.4%)	230 (5.8%)	3,970 (100%)
District 3	1,462 (32.9%)	1,323 (29.8%)	332 (7.5%)	311 (7.0%)	395 (8.9%)	177 (4.0%)	90 (2.0%)	156 (3.5%)	192 (4.3%)	4,439 (100%)
District 4	3,231 (52.2%)	1,049 (17.0%)	142 (2.3%)	263 (4.2%)	337 (5.5%)	47 (0.8%)	283 (4.6%)	657 (10.6%)	176 (2.8%)	6,184 (100%)
District 5	944 (29.7%)	706 (22.2%)	212 (6.7%)	213 (6.7%)	350 (11.0%)	182 (5.7%)	71 (2.2%)	242 (7.6%)	255 (8.0%)	3,175 (100%)
District 6	1,680 (33.0%)	1,044 (20.5%)	815 (16.0%)	253 (5.0%)	347 (6.8%)	368 (7.2%)	150 (2.9%)	233 (4.6%)	206 (4.0%)	5,095 (100%)
District 7	3,724 (59.5%)	648 (10.4%)	142 (2.3%)	245 (3.9%)	386 (6.2%)	34 (0.6%)	583 (9.3%)	438 (7.0%)	53 (0.8%)	6,255 (100%)
District 8	3,636 (54.6%)	955 (14.3%)	180 (2.7%)	615 (9.2%)	455 (6.8%)	62 (0.9%)	381 (5.7%)	305 (4.6%)	74 (1.1%)	6,663 (100%)
District 9	1,100 (42.9%)	381 (14.9%)	308 (12.0%)	382 (14.9%)	182 (7.1%)	95 (3.7%)	67 (2.6%)	32 (1.3%)	16 (0.6%)	2,563 (100%)
District 10	1,086 (30.9%)	993 (28.2%)	400 (11.4%)	129 (3.7%)	460 (13.1%)	150 (4.3%)	50 (1.4%)	215 (6.1%)	37 (1.1%)	3,520 (100%)
District 11	2,491 (60.8%)	671 (16.4%)	223 (5.4%)	122 (3.0%)	261 (6.4%)	92 (2.3%)	84 (2.1%)	129 (3.2%)	24 (0.6%)	4,097 (100%)
District 12	1,325 (67.1%)	350 (17.7%)	0 (0.0%)	75 (3.8%)	87 (4.4%)	1 (0.0%)	59 (3.0%)	78 (4.0%)	1 (0.0%)	1,976 (100%)
Statewide Total	22,319 (44.4%)	9,517 (18.9%)	3,540 (7.0%)	2,918 (5.8%)	4,120 (8.2%)	1,680 (3.3%)	1,909 (3.8%)	2,765 (5.5%)	1,492 (3.0%)	50,261 (100%)

APPENDIX E – 2016 PAVEMENT CONDITION BY DISTRICT AND ROADWAY CLASSIFICATION BASED ON CALTRANS PAVEMENT RATING SYSTEM

TABLE 27. 2016 PAVEMENT CONDITION BASED ON CALTRANS PAVEMENT RATING SYSTEM

District	Class 1 Green	Class 2 Green	Class 3 Green	Class 1 Yellow	Class 2 Yellow	Class 3 Yellow	Class 1 Red	Class 2 Red	Class 3 Red	Sub-Total
District 1	715 (30.5%)	419 (17.9%)	207 (8.8%)	202 (8.6%)	129 (5.5%)	92 (3.9%)	145 (6.2%)	185 (7.9%)	248 (10.6%)	2,343 (100%)
District 2	648 (16.6%)	777 (19.9%)	366 (9.4%)	168 (4.3%)	626 (16.0%)	343 (8.8%)	123 (3.2%)	385 (9.9%)	467 (12.0%)	3,901 (100%)
District 3	1,280 (28.9%)	1,087 (24.5%)	238 (5.4%)	406 (9.2%)	479 (10.8%)	173 (3.9%)	176 (4.0%)	309 (7.0%)	287 (6.5%)	4,435 (100%)
District 4	2,897 (47.2%)	932 (15.2%)	103 (1.7%)	410 (6.7%)	290 (4.7%)	68 (1.1%)	420 (6.8%)	827 (13.5%)	193 (3.1%)	6,141 (100%)
District 5	848 (26.5%)	580 (18.1%)	174 (5.4%)	239 (7.5%)	401 (12.5%)	194 (6.1%)	142 (4.4%)	336 (10.5%)	282 (8.8%)	3,197 (100%)
District 6	1,701 (33.6%)	938 (18.5%)	749 (14.8%)	229 (4.5%)	430 (8.5%)	412 (8.1%)	154 (3.0%)	226 (4.5%)	228 (4.5%)	5,068 (100%)
District 7	3,203 (50.8%)	517 (8.2%)	46 (0.7%)	502 (8.0%)	368 (5.8%)	17 (0.3%)	884 (14.0%)	601 (9.5%)	167 (2.6%)	6,304 (100%)
District 8	3,684 (55.0%)	996 (14.9%)	177 (2.6%)	585 (8.7%)	420 (6.3%)	80 (1.2%)	390 (5.8%)	298 (4.4%)	69 (1.0%)	6,700 (100%)
District 9	1,061 (42.0%)	281 (11.1%)	240 (9.5%)	371 (14.7%)	205 (8.1%)	95 (3.8%)	114 (4.5%)	92 (3.6%)	64 (2.5%)	2,524 (100%)
District 10	943 (26.8%)	773 (21.9%)	443 (12.6%)	206 (5.8%)	459 (13.0%)	95 (2.7%)	114 (3.2%)	443 (12.6%)	46 (1.3%)	3,522 (100%)
District 11	2,226 (53.0%)	510 (12.1%)	193 (4.6%)	376 (9.0%)	395 (9.4%)	135 (3.2%)	158 (3.8%)	166 (4.0%)	39 (0.9%)	4,200 (100%)
District 12	1,166 (58.0%)	331 (16.5%)	1 (0.0%)	212 (10.5%)	102 (5.1%)	0 (0.0%)	107 (5.3%)	91 (4.5%)	1 (0.0%)	2,010 (100%)
Statewide Total	20,374 (40.5%)	8,143 (16.2%)	2,938 (5.8%)	3,906 (7.8%)	4,034 (8.0%)	1,705 (3.4%)	2,927 (5.8%)	3,956 (7.9%)	2,091 (4.2%)	50,346 (100%)

TABLE 28. 2018 N.H.S. INTERSTATE I.R.I.

District	Lane-Miles of I.R.I. Less Than 95	Lane-Miles of I.R.I. Between 95 to 170	Lane-Miles of I.R.I. Greater Than 170	Sub-Total
District 1	0	0	0	0
District 2	671	38	1	710
District 3	1,044	271	18	1,333
District 4	1,519	630	148	2,298
District 5	0	0	0	0
District 6	643	98	35	777
District 7	1,430	853	274	2,557
District 8	2,627	688	76	3,391
District 9	0	0	0	0
District 10	565	59	7	631
District 11	1,631	311	17	1,959
District 12	411	319	25	755
Statewide Total	10,541	3,269	601	14,411

TABLE 29. 2018 N.H.S. NON-INTERSTATE I.R.I.

District	Lane-Miles of I.R.I. Less Than 95	Lane-Miles of I.R.I. Between 95 to 170	Lane-Miles of I.R.I. Greater Than 170	Sub-Total
District 1	946	332	41	1,319
District 2	1,083	330	45	1,458
District 3	1,342	330	63	1,735
District 4	1,349	1,099	512	2,960
District 5	1,361	421	93	1,875
District 6	1,813	655	91	2,559
District 7	1,645	1,267	383	3,295
District 8	785	809	211	1,805
District 9	1,496	104	9	1,609
District 10	1,137	482	102	1,721
District 11	667	510	70	1,247
District 12	708	401	73	1,182
Statewide Total	14,334	6,739	1,693	22,765

TABLE 30. 2018 NON-N.H.S. I.R.I.

District	Lane-Miles of I.R.I. Less Than 95	Lane-Miles of I.R.I. Between 95 to 170	Lane-Miles of I.R.I. Greater Than 170	Sub-Total
District 1	225	463	319	1,007
District 2	847	758	196	1,802
District 3	627	551	193	1,371
District 4	155	413	358	926
District 5	466	555	278	1,300
District 6	1,057	564	138	1,758
District 7	90	216	96	403
District 8	708	631	127	1,466
District 9	694	232	28	954
District 10	787	320	61	1,168
District 11	365	471	55	891
District 12	6	26	6	38
Statewide Total	6,028	5,201	1,856	13,085

TABLE 31. 2016 N.H.S. INTERSTATE I.R.I.

District	Lane-Miles of I.R.I. Less Than 95	Lane-Miles of I.R.I. Between 95 to 170	Lane-Miles of I.R.I. Greater Than 170	Sub-Total
District 1	0	0	0	0
District 2	633	45	2	679
District 3	1,044	260	27	1,331
District 4	1,430	632	205	2,267
District 5	0	0	0	0
District 6	601	132	43	776
District 7	1,354	840	403	2,597
District 8	2,470	805	126	3,401
District 9	0	0	0	0
District 10	530	84	17	631
District 11	1,596	388	34	2,018
District 12	436	309	27	772
Statewide Total	10,093	3,495	885	14,473

TABLE 32. 2016 N.H.S. NON-INTERSTATE I.R.I.

District	Lane-Miles of I.R.I. Less Than 95	Lane-Miles of I.R.I. Between 95 to 170	Lane-Miles of I.R.I. Greater Than 170	Sub-Total
District 1	932	344	57	1,333
District 2	1,064	320	41	1,425
District 3	1,348	307	81	1,736
District 4	1,205	1,098	645	2,948
District 5	1,326	454	96	1,877
District 6	1,738	683	110	2,532
District 7	1,263	1,303	733	3,299
District 8	772	831	221	1,823
District 9	1,457	119	13	1,589
District 10	972	609	143	1,725
District 11	638	537	88	1,263
District 12	605	487	108	1,200
Statewide Total	13,320	7,093	2,337	22,750

TABLE 33. 2016 NON-N.H.S. I.R.I.

District	Lane-Miles of I.R.I. Less Than 95	Lane-Miles of I.R.I. Between 95 to 170	Lane-Miles of I.R.I. Greater Than 170	Sub-Total
District 1	209	492	309	1,010
District 2	803	770	225	1,797
District 3	531	597	241	1,369
District 4	127	410	388	926
District 5	356	623	341	1,320
District 6	961	617	181	1,759
District 7	24	161	223	408
District 8	662	678	136	1,476
District 9	626	274	34	935
District 10	686	404	76	1,166
District 11	372	456	91	919
District 12	5	28	6	39
Statewide Total	5,362	5,511	2,250	13,123

APPENDIX H – H.M.1 MAINTENANCE STRATEGY COST PER LANE-MILE AND LANE-MILES TREATED FOR F.Y. 2015/16 THROUGH F.Y. 2017/18

TABLE 34. H.M.1 MAINTENANCE STRATEGY COST PER LANE-MILE

H.M.1 Treatment Type	F.Y. 2015/16 Cost[4] per Lane-Mile	F.Y. 2016/17 Cost[4] per Lane-Mile	F.Y. 2017/18 Cost[4] per Lane-Mile	Weighted Average of Cost[4] per Lane-Mile
Chip Seal	$53,856	$50,538	$36,425	$48,536
Slurry Seal	$57,457	$88,862	$92,387	$78,401
Seal Coat - Preventive	$64,122	$44,987	$106,432	$59,719
Micro Surfacing	Not Used	$30,638	Not Used	$30,638
Mill and Fill	$170,843	$96,936	Not Used	$157,495
H.M.A. Thin Overlay - Preventive	$135,540	$143,609	$159,454	$144,903
H.M.A. Thin Overlay	$132,437	$134,215	$154,919	$147,893
H.M.A. Medium Overlay	$159,910	$267,561	$269,483	$266,517
H.M.A. Thick Overlay	$282,974	Not Used	Not Used	$282,974
Cold In-Place Recycling	Not Used	Not Used	$389,792	$389,792
Cold In-Place Recycling - Class 3	$320,758	$293,501	$282,307	$302,117
Dig Outs - Corrective	$444,058	$492,886	$342,169	$452,557
Grinding - Preventive	Not Used	$96,862	$129,517	$107,886
Slab Replacement - Preventive	$3,490,400	Not Used	Not Used	$3,490,400
Slab Replacement - Corrective	$2,434,727	$6,154,762	$2,189,290	$2,278,073
Combined Strategies	$167,779	$107,400	$286,416	$235,187

TABLE 35. H.M.1 MAINTENANCE STRATEGY LANE-MILES TREATED

H.M.1 Treatment Type	F.Y. 2015/16 Lane-Miles Treated	F.Y. 2016/17 Lane-Miles Treated	F.Y. 2017/18 Lane-Miles Treated	Weighted Average of Lane-Miles Treated
Chip Seal	473	441	280	398
Slurry Seal	151	20	211	128
Seal Coat - Preventive	66	59	12	46
Micro Surfacing	Not Used	18	Not Used	18
Mill and Fill	160	35	Not Used	98
H.M.A. Thin Overlay - Preventive	557	740	424	574
H.M.A. Thin Overlay	245	42	620	302
H.M.A. Medium Overlay	19	17	672	236
H.M.A. Thick Overlay	10	Not Used	Not Used	10
Cold In-Place Recycling	Not Used	Not Used	31	31
Cold In-Place Recycling - Class 3	52	25	38	39
Dig Outs - Corrective	14	21	7	14
Grinding - Preventive	Not Used	138	70	104
Slab Replacement - Preventive	2	Not Used	Not Used	2
Slab Replacement - Corrective	1	0	10	4
Combined Strategies	58	14	112	61

[4] Costs associated to pavement-related contract bid items only and exclude project support costs. Does not include on-call maintenance contracts or Director's Order contracts.

APPENDIX I – S.H.O.P.P.-C.A.P.M. STRATEGY COST PER LANE-MILE AND LANE-MILES TREATED FOR F.Y. 2015/16 THROUGH F.Y. 2017/18

TABLE 36. C.A.P.M. STRATEGY COST PER LANE-MILE

C.A.P.M. Treatment Type	F.Y. 2015/16 Cost[5] per Lane-Mile	F.Y. 2016/17 Cost[5] per Lane-Mile	F.Y. 2017/18 Cost[5] per Lane-Mile	Weighted Average of Cost[5] per Lane-Mile
Chip Seal	$105,569	Not Used	$98,324	$102,247
Cold In-Place Recycling	$262,307	$298,644	Not Used	$283,754
Grind/Replace Slabs – C.A.P.M.	$226,264	$446,822	$173,538	$212,582
Slab Replacement – C.A.P.M.	$2,732,021	Not Used	Not Used	$2,732,021
P.C.C. Lane Replacement	$2,849,403	Not Used	Not Used	$2,849,403
H.M.A. Thin Overlay	$108,857	Not Used	Not Used	$108,857
H.M.A. Medium Overlay	$240,501	$313,124	$358,626	$301,171
H.M.A. Thick Overlay	$391,003	$583,602	$608,043	$489,551
Combined Strategies	$387,593	$433,762	Not Used	$407,104

TABLE 37. C.A.P.M. STRATEGY LANE-MILES TREATED

C.A.P.M. Treatment Type	F.Y. 2015/16 Lane-Miles Treated	F.Y. 2016/17 Lane-Miles Treated	F.Y. 2017/18 Lane-Miles Treated	Weighted Average of Lane-Miles Treated
Chip Seal	34	Not Used	28	31
Cold In-Place Recycling	42	60	Not Used	51
Grind/Replace Slabs – C.A.P.M.	396	24	283	234
Slab Replacement – C.A.P.M.	4	Not Used	Not Used	4
P.C.C. Lane Replacement	9	Not Used	Not Used	9
H.M.A. Thin Overlay	48	Not Used	Not Used	48
H.M.A. Medium Overlay	652	542	575	590
H.M.A. Thick Overlay	31	7	20	19
Combined Strategies	98	72	Not Used	85

[5] Costs associated to pavement-related contract bid items only and exclude project support costs. Does not include on-call maintenance contracts or Director's Order contracts.

APPENDIX J – S.H.O.P.P.-REHABILITATION STRATEGY COST PER LANE-MILE AND LANE-MILES TREATED FOR F.Y. 2015/16 THROUGH F.Y. 2017/18

TABLE 38. REHABILITATION STRATEGY COST PER LANE-MILE

Rehabilitation Treatment Type	F.Y. 2015/16 Cost[6] per Lane-Mile	F.Y. 2016/17 Cost[6] per Lane-Mile	F.Y. 2017/18 Cost[6] per Lane-Mile	Weighted Average of Cost[6] per Lane-Mile
Crack Seat and Overlay	Not Used	$1,180,460	$1,297,485	$1,224,849
C.R.C.P. Lane Replacement	$1,400,020	$1,477,212	$2,189,419	$1,571,541
P.C.C. Lane Replacement	$1,450,542	$1,734,103	$1,690,388	$1,620,327
P.C.C. Overlay	Not Used	Not Used	$2,878,053	$2,878,053
Full Depth Reclamation	$560,748	Not Used	$1,266,068	$1,266,068
H.M.A. Thick Overlay	$574,271	$873,231	$648,522	$718,640
Combined Strategies	Not Used	Not Used	$1,310,442	$1,310,442

TABLE 39. REHABILITATION STRATEGY LANE-MILES TREATED

Rehabilitation Treatment Type	F.Y. 2015/16 Lane-Miles Treated	F.Y. 2016/17 Lane-Miles Treated	F.Y. 2017/18 Lane-Miles Treated	Weighted Average of Lane-Miles Treated
Crack Seat and Overlay	Not Used	18	11	15
C.R.C.P. Lane Replacement	102	85	41	76
P.C.C. Lane Replacement	64	82	22	56
P.C.C. Overlay	Not Used	Not Used	16	16
Full Depth Reclamation	35	Not Used	6	21
H.M.A. Thick Overlay	163	190	84	146
Combined Strategies	Not Used	Not Used	25	25

[6] Costs associated to pavement-related contract bid items only and exclude project support costs. Does not include on-call maintenance contracts or Director's Order contracts.