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# MEMORANDUM

**To:** Mayor and City Council

**From:** Michael Smith, Public Works Director

**Date:** February 24, 2014

**Subject:** **Discussion of Five Year Paving Plan Update**

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## ITEM DESCRIPTION

Discussion of an update to the Five Year Paving Plan based on the new pavement condition ratings developed from the citywide pavement evaluation completed in December 2013.

## BACKGROUND

IMS Infrastructure services working on behalf of the City recently completed an update to the 2009 citywide pavement condition assessment. The update consisted of traveling every city street with a Road Surface Tester (RST) truck equipped with lasers, cameras and other sensors to evaluate the extent and nature of cracking, rutting, roughness (ride quality) and other factors such as drainage conditions. These factors were then weighted and combined to produce a numerical pavement condition rating/index (PCI) between 10 (worst) and 100 (best). Key findings from the most recent assessment include:

- There has been significant improvement in the condition of arterial and collector roads. The percentage of pavement area in good to excellent condition for these roads increased from 45% to 60%. The percentage in poor condition remained roughly the same.
- By area, the percentage of neighborhood streets in poor condition has grown from 15% to 45%.
- Overall about one third of City streets are in good to excellent condition and about one third are in poor to very poor condition. The remaining third are in fair condition. The overall pavement condition rating is 66 compared to 69 in 2009.

These pavement assessment results are very close to the projections included in the 2009 report. Over the last three years, the City has targeted $2,000,000, including any money provided by the state, as a minimum annual funding level that could be sustained over time. At this funding level the 2009 report projected that the backlog of streets in poor condition would grow to 42% and that the total pavement condition rating would drop by 2 points in five years. The actual backlog and drop in the overall rating are slightly higher primarily due to limited funding in the first year (2010) startup of the paving program.

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**DISCUSSION**

After years of deferred maintenance it was fully anticipated that it would take 5 to 10 years to begin to catch up on the paving backlog. The 2009 report stated: "An annual budget between $2.5 and $3.0 million dedicated to roadway rehabilitation is required to achieve the target PCI of between 70 and 75 within 5 years and maintain the backlog below 15% within 10 years." Though the City has set a minimum funding target of $2 million, the Council has recognized the need for additional resources and been able to allocate additional funding in 2 of the last 3 years to reach the $2.5 million recommended threshold. At its recent retreat, the Council discussed raising the minimum funding target to $2.5 million with the additional $400,000 in local funding allocated to neighborhood streets. This policy direction aligns well with the findings of the most recent pavement assessment. More funding will be available to address the backlog of streets in poor condition most of which are neighborhood streets. At the $2.5 million funding level, the overall pavement rating should increase in the next 5 years and the backlog should not increase.

The five year paving plan presented in Attachment "A" has been updated by increasing the funding level to $2.5 million in future years and adding a list of streets for 2018. Arterial and collector streets have been reprioritized based on the anticipated timing of other capital projects and on the updated condition ratings. As directed by Council at the retreat, the lowest rated neighborhood streets based on the updated ratings have been added where possible without removing or deferring any neighborhood streets already listed in previous plans. In programming neighborhood streets staff also considered the recommendation from the assessment report to group stretches of road that have differing years of rehabilitation but that are in close geographic proximity to each other.

The City's goal has been to target 70% of the paving funds each year to the arterial and collector streets because they receive the most traffic and are the most expensive to repair. With an additional $400,000 allocated specifically to neighborhood streets in future years, the target percentage will now be 60% of the projected $2.5 million budget. It should be noted however that because of the significant progress the City has already made towards the arterial and collector streets the actual allocation to these streets in the five year paving list is closer to 50% rather than 60%.

In summary, the proposed five year plan strives to sustain the progress made on the arterial and collector roads while doubling the funding over previous years for neighborhood streets to address the backlog. As requested during discussion of the 2014 paving plan at the January 13th City Council meeting, staff has also developed a list of neighborhood streets that should move up the list if surplus funds become available in 2014 or subsequent years. These streets were selected based on their current condition, proximity to other planned paving and relation to nearby capital projects. Streets underlain by asbestos cement (AC) pipe were not considered because advanced planning and coordination with the County will be required.

**RECOMMENDED ACTION**

Staff recommends approval of the five year paving plan.

# ATTACHMENT "A"
# 5-YEAR CAPITAL PAVING PLAN

| Street | From | To | Length | Strategy | Estimated Cost | Cumulative by Year | Notes |
|---|---|---|---|---|---|---|---|
| **2014** | | | | | | | |
| CHAMBLEE DUNWOODY RD | CAMBRIDGE DR | VALLEY VIEW DR | 3277 | Mill, Patch and Overlay 1.5" | $ 100,000 | $ 100,000 | Deferred from 2013 for AC Pipe Replacement |
| CHAMBLEE DUNWOODY RD. | VALLEY VIEW RD | WOMACK RD | 2215 | Mill, Patch and Overlay 2" | $ 158,000 | $ 258,000 | Moved up from 2017 for AC Pipe Replacement |
| CHAMBLEE DUNWOODY RD | WOMACK RD | ROBERTS DR | 3997 | Mill, Patch and Overlay 2" | $ 378,000 | $ 636,000 | Deferred from 2013 for AC Pipe Replacement |
| CENTER DR | CHAMBLEE DUNWOODY | END | 561 | Mill, Patch and Overlay 2" | $ 28,000 | $ 664,000 | Added |
| DUNWOODY VILLAGE PKWY | CHAMBLEE DUNWOODY RD | SOUTH END | 450 | Mill, Patch and Overlay 2" | $ 21,000 | $ 685,000 | Added |
| MOUNT VERNON RD | ASHFORD DUNWOODY RD | CHAMBLEE DUNWOODY | 1450 | Mill, Patch and Overlay 2.5" | $ 181,000 | $ 866,000 | Deferred from 2013 for AC Pipe Replacement |
| MOUNT VERNON RD | CHAMBLEE DUNWOODY | VERNON OAKS DR | 4143 | Mill, Patch and Overlay 1.5" | $ 342,000 | $ 1,208,000 | Deferred from 2013 for AC Pipe Replacement |
| NANDINA LN | CHAMBLEE DUNWOODY | MOUNT VERNON RD | 636 | Mill, Patch and Overlay 2" | $ 35,000 | $ 1,243,000 | Added, AC Pipe Replacement |
| PERIMETER CENTER PL | PERIMETER CENTER W | MEADOW LANE RD | 1911 | Mill, Patch and Overlay 2.5" | $ 249,000 | $ 1,492,000 | Deferred from 2013 |
| TAMASSEE CT | N PEACHTREE RD | END | 723 | Deep Patch and Pave | $ 32,000 | $ 1,524,000 | |
| LURAY CT | LURAY DR | END | 964 | Deep Patch and Pave | $ 44,000 | $ 1,568,000 | |
| FRONT ROYAL CT | LURAY DR | END | 337 | Deep Patch and Pave | $ 12,000 | $ 1,580,000 | |
| CHERRING LN | PEELER RD | CHERRING DR | 1238 | Deep Patch and Pave | $ 35,000 | $ 1,615,000 | |
| CHERRING DR | PEELER RD | TILLY MILL RD | 1666 | Deep Patch and Pave | $ 50,000 | $ 1,665,000 | |
| VERDON CT | VERDON DR | END | 241 | Deep Patch and Pave | $ 8,000 | $ 1,673,000 | |
| BORDEAU CT | VERDON DR | END | 590 | Deep Patch and Pave | $ 18,000 | $ 1,691,000 | |
| VERMACK RIDGE | VERMACK RD | END | 1112 | Deep Patch and Pave or FDR | $ 57,000 | $ 1,748,000 | AC Pipe Replacement |
| CHAMBLEE DUNWOODY RD | COTILLION DR | PEELER RD | 3426 | Patching & Crack Sealing | $ 18,000 | $ 1,766,000 | |
| CHAMBLEE DUNWOODY RD | ROBERTS DR | SPALDING DR | | Crack Seal | $ 31,000 | $ 1,797,000 | |
| CHAMBLEE DUNWOODY VALLEY VIEW TO WOMACK BIKE LANES | | | | | $ 125,000 | $ 1,922,000 | Partial Funding |
| | | | | Contingency | 9% | $ 179,445 | |
| | | | | | City Funding | $ 1,800,000 | |
| | | | | | LMIG Funding | $ 301,445 | |
| | | | | | **2014 Total** | $ 2,101,445 | |

# ATTACHMENT "A"
## 5-YEAR CAPITAL PAVING PLAN

| Street | From | To | Length | Strategy | Estimated Cost | Cumulative by Year | Notes |
|---|---|---|---|---|---|---|---|
| **2015** | | | | | | | |
| INDEPENDENCE SQ | PEELER RD | CHAMBLEE DUNWOODY F | 950 | Deep Patch and Pave | $ 40,000 | $ 40,000 | Added based on new rating |
| TILLY MILL RD | 500 FT. W. N. PEACHTREE | WOMACK RD | 2748 | Mill, Patch and Overlay 1.5" | $ 175,000 | $ 215,000 | Deferred from 2014 for intersection and sidewalk projects |
| TILLY MILL RD | PEELER RD | 500 FT. E. OF N. PEACHTR | 1315 | Mill, Patch and Overlay 1.5" | $ 63,000 | $ 278,000 | Deferred from 2014 for intersection project |
| VERMACK RD | MOUNT VERNON RD | WOMACK RD | 2864 | Mill, Patch and Overlay 2" | $ 207,000 | $ 485,000 | |
| VALLEY VIEW RD | ASHFORD DUNWOODY | CHAMBLEE DUNWOODY | 3660 | Deep Patch and Pave | $ 159,000 | $ 644,000 | AC Pipe |
| VANDERLYN DR | VERMACK RD | END | 2339 | Deep Patch and Pave | $ 96,000 | $ 740,000 | AC Pipe |
| HIDDEN BRANCHES DR | MOUNT VERNON RD | TRAILRIDGE LN | 1343 | Deep Patch and Pave | $ 53,000 | $ 793,000 | AC Pipe |
| HIDDEN BRANCHES DR | TRAILRIDGE LN | TWIN BRANCHES WY | 1617 | Deep Patch and Pave | $ 82,000 | $ 875,000 | AC Pipe |
| HIDDEN BRANCHES DR | TWIN BRANCHES WAY | WINDING BRANCH | 1459 | Deep Patch and Pave | $ 58,000 | $ 933,000 | AC Pipe |
| PINE BARK CT | HIDDEN BRANCHES DR | END | 508 | Deep Patch and Pave | $ 16,000 | $ 949,000 | AC Pipe |
| PINE BARK LN | WINDING BRANCH CI | END | 221 | Deep Patch and Pave | $ 14,000 | $ 963,000 | AC Pipe |
| HIDDEN BRANCHES CL | HIDDEN BRANCHES DR | END | 271 | Deep Patch and Pave | $ 28,000 | $ 991,000 | AC Pipe, Added |
| HUNTERS BRANCH DR | HIDDEN BRANCHES DR | CITY LIMIT | 459 | Deep Patch and Pave | $ 16,000 | $ 1,007,000 | AC Pipe. Added |
| PINE BRANCH PT | PINE BARK CIR | END | 535 | Deep Patch and Pave | $ 33,000 | $ 1,040,000 | AC Pipe, Added |
| PINE BRANCHES CL | PINE BARK CIR | END | 413 | Deep Patch and Pave | $ 29,000 | $ 1,069,000 | AC Pipe, Added |
| PINE BARK CIR | HIDDEN BRANCHES DR | HIDDEN BRANCHES DR | 1532 | Deep Patch and Pave | $ 64,000 | $ 1,133,000 | AC Pipe, Added |
| CLARIDGE CT | SUDBURY RD | END | 261 | Deep Patch and Pave | $ 16,000 | $ 1,149,000 | AC Pipe |
| WELLSHIRE LN | WELLSHIRE PL | END | 1076 | Deep Patch and Pave | $ 54,000 | $ 1,203,000 | AC Pipe |
| EQUESTRIAN CT | EQUESTRIAN WAY | END | 231 | Deep Patch and Pave | $ 9,000 | $ 1,212,000 | |
| THE WOODSONG | WOODSONG DR | END | 257 | Deep Patch and Pave | $ 16,000 | $ 1,228,000 | |
| WOODSONG CT | WOODSONG TRL | END | 1010 | Deep Patch and Pave or FDR | $ 57,000 | $ 1,285,000 | AC Pipe |
| WOODSONG TR | DUNWOODY CLUB DR | DUNWOODY CLUB DR | 2518 | Deep Patch and Pave or FDR | $ 117,000 | $ 1,402,000 | AC Pipe |
| WOODSONG DR | WOODSONG TRL | END | 1442 | Deep Patch and Pave | $ 55,000 | $ 1,457,000 | AC Pipe |
| WITHMERE CT | WITHMERE WAY | END | 185 | Deep Patch and Pave | $ 17,000 | $ 1,474,000 | AC Pipe |
| RESTON CT | WITHMERE WAY | END | 462 | Deep Patch and Pave | $ 25,000 | $ 1,499,000 | AC Pipe |
| SIRRON CT | HOLLY OAK PL | END | 617 | Deep Patch and Pave | $ 36,000 | $ 1,535,000 | AC Pipe, Added |
| HOLLY OAK PL | CHAMBLEE DUNWOODY RD | END | 719 | Deep Patch and Pave | $ 34,000 | $ 1,569,000 | AC Pipe, Added |
| SHADOW CT | END | END | 581 | Deep Patch and Pave | $ 38,000 | $ 1,607,000 | Added |
| SHADOW BEND | CHAMBLEE DUNWOODY RD | SHADOW CT | 769 | Deep Patch and Pave | $ 29,000 | $ 1,636,000 | AC Pipe, Added |
| PINE ACRES | CHAMBLEE DUNWOODY RD | END | 663 | Deep Patch and Pave | $ 38,000 | $ 1,674,000 | Added |
| CHAMBLEE DUNWOODY BIKE LANES | | | | | $ 350,000 | $ 2,024,000 | Remaining Funding |
| Contingency | | | | | 19% | $ 476,000 | |
| | | | | | **2015 Total** | 2500000 | |

# ATTACHMENT "A"
# 5-YEAR CAPITAL PAVING PLAN

| Street | From | To | Length | Strategy | Estimated Cost | Cumulative by Year | Notes |
|---|---|---|---|---|---|---|---|
| **2016** | | | | | | | |
| BARCLAY DR | PEACHFORD RD | N PEACHTREE RD | 2960 | Mill, Patch and Overlay 1.5" | $ 141,000 | $ 141,000 | Added |
| CHAMBLEE DUNWOODY RD | PEELER RD | CAMBRIDGE DR | 2207 | Mill, Patch and Overlay 1.5" | $ 131,489 | $ 272,489 | AC Pipe, Moved up from 2017 |
| DUNWOODY CLUB DR | BROOKE FARM DR | HAPPY HOLLOW RD | 5182 | Mill, Patch and Overlay 2" | $ 143,500 | $ 415,989 | Assumes 1/2 cost paid by COSS |
| JETT FERRY RD | MOUNT VERNON RD | DUNWOODY CLUB DR | 960 | Mill, Patch and Overlay 2" | $ 56,000 | $ 471,989 | Added |
| MOUNT VERNON RD | CORNERS DR | WELLESLEY LN | 4003 | Mill, Patch and Overlay 2" | $ 300,000 | $ 771,989 | AC Pipe |
| MOUNT VERNON RD | WELLESLEY LN | SAFFRON DR | 2307 | Mill, Patch and Overlay 2" | $ 177,000 | $ 948,989 | AC Pipe |
| N PEACHTREE RD | BARCLAY DR | 300 FT. S. OF PEELER RD | 638 | Mill, Patch and Overlay 2.5" | $ 63,000 | $ 1,011,989 | Deferred from 2014 |
| PEELER RD | ADAMS RD | 400 FT. W. OF N PEACHTR | 3484 | Mill, Patch and Overlay 1.5" | $ 151,000 | $ 1,162,989 | Deferred from 2014, AC Pipe |
| SPALDING DR | WEST CITY LIMIT | CHAMBLEE DUNWOODY F | 541 | Mill, Patch and Overlay 2" | $ 33,016 | $ 1,196,005 | Added |
| DUNKERRIN LN | TILLY MILL RD | DUNKERRIN CIR | 1056 | Full Depth Reclamation | $ 53,000 | $ 1,249,005 | Supplemental |
| LEDGEWOOD DR | RIVERGLENN CIR | DUNOVER CIR | 525 | Full Depth Reclamation | $ 30,000 | $ 1,279,005 | Supplemental |
| CLARIDGE SQ | DUNWOODY CLUB DR | END | 611 | Deep Patch and Pave | $ 25,000 | $ 1,304,005 | |
| CORNERS CT | CORNERS DR | END | 446 | Deep Patch and Pave | $ 23,000 | $ 1,327,005 | Added |
| CORNERS DR | MOUNT VERNON RD | VERMACK RD | 1283 | Deep Patch and Pave | $ 56,000 | $ 1,383,005 | Added |
| CORNERS CV | VERMACK RD | END | 330 | Deep Patch and Pave | $ 18,000 | $ 1,401,005 | Added |
| BRANDYWINE CT | VERMACK RD | END | 535 | Deep Patch and Pave | $ 22,000 | $ 1,423,005 | Added |
| BETHESDA CT | BETHESDA TRL | END | 310 | Full Depth Reclamation | $ 27,000 | $ 1,450,005 | Added, Supplemental |
| BETHESDA TRL | OLD SPRING HOUSE LN | END | 819 | Deep Patch and Pave | $ 49,000 | $ 1,499,005 | Added, Supplemental |
| BISHOP HOLLOW CT | BISHOP HOLLOW RD | END | 294 | Deep Patch and Pave | $ 20,000 | $ 1,519,005 | Added, Supplemental |
| BISHOP HOLLOW RUN | OLD SPRING HOUSE LN | CONGRESS CIR | 1271 | Deep Patch and Pave or FDR | $ 69,000 | $ 1,588,005 | Added, Supplemental |
| DELLROSE DR | END | END | 1320 | Deep Patch and Pave | $ 60,000 | $ 1,648,005 | Added |
| DELLROSE CT | DELLROSE DR | END | 409 | Deep Patch and Pave | $ 17,000 | $ 1,665,005 | Added |
| BRUNNING CT | WATERFORD DR | END | 795 | Deep Patch and Pave | $ 41,000 | $ 1,706,005 | Added |
| WATERFORD CT | DUNWOODY CLUB DR | END | 2465 | Deep Patch and Pave | $ 103,000 | $ 1,809,005 | Added |
| QUEENSBOROUGH DR | CORONATION DR | END | 1393 | Deep Patch and Pave | $ 55,000 | $ 1,864,005 | Added |
| OLDE VILLAGE CT | OLDE VILLAGE RUN | END | 1066 | Deep Patch and Pave | $ 59,000 | $ 1,923,005 | AC Pipe, Added |
| OLDE VILLAGE RUN | VERMACK RD | END | 2739 | Deep Patch and Pave | $ 99,000 | $ 2,022,005 | Added |
| OLDE VILLAGE LN | PEELER RD | OLDE VILLAGE RUN | 2241 | Deep Patch and Pave | $ 69,000 | $ 2,091,005 | AC Pipe, Added |
| | | | | | 16% | $ 408,995 | |
| | | | | | **2016 Total** | $ 2,500,000 | |



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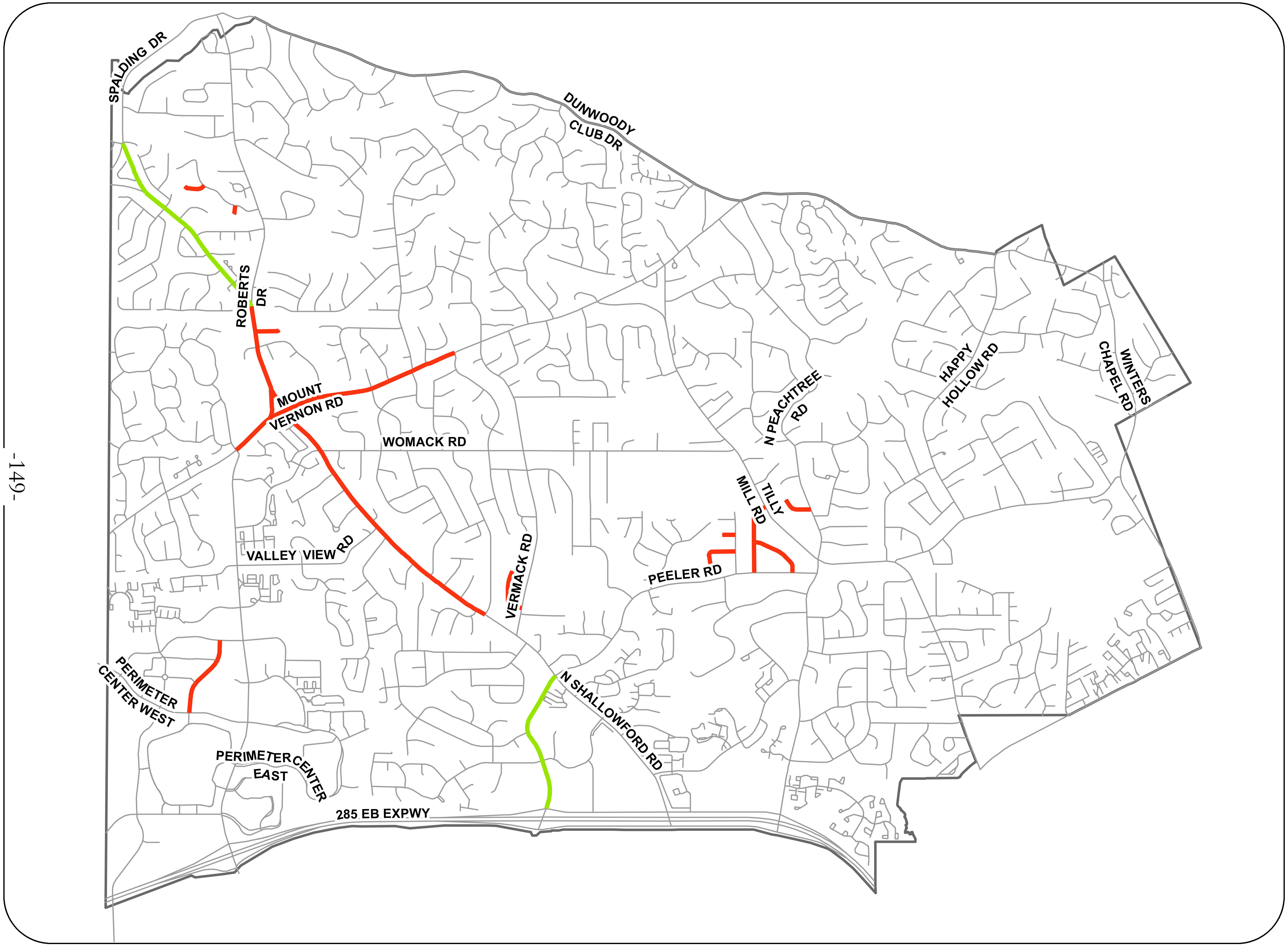
# ATTACHMENT "A"
# 5-YEAR CAPITAL PAVING PLAN

| Street | From | To | Length | Strategy | Estimated Cost | Cumulative by Year | Notes |
|---|---|---|---|---|---|---|---|
| **2017** | | | | | | | |
| ASHFORD DUNWOODY RD | HAMMOND DR | MOUNT VERNON RD | 8562 | Mill, Patch and Overlay 1.5" | $ 791,000 | $ 791,000 | Moved down from 2016 and extended to Mount Vernon |
| HAMMOND DR | ASHFORD DUNWOODY RD | WEST CITY LIMIT | 2758 | Mill, Patch and Overlay 1.5" | $ 237,000 | $ 1,028,000 | |
| PERIMETER CENTER PLACE | PERIMETER CENTER WEST | HAMMOND DR | 4323 | Mill, Patch and Overlay 1.5" | $ 388,000 | $ 1,416,000 | Added |
| DUNWOODY PARK S | DUNWOODY PARK | COTILLION DR | 1238 | Mill, Patch and Overlay 1.5" | $ 49,000 | $ 1,465,000 | Added |
| MANGET WAY | CHAMBLEE DUNWOO | ASHFORD WALK | 1208 | Deep Patch and Pave or FDR | $ 71,000 | $ 1,536,000 | |
| BRENDON DR | N PEACHTREE RD | DAVANTRY | 2838 | Deep Patch and Pave | $ 73,000 | $ 1,609,000 | AC Pipe |
| SANCROFF CT | N PEACHTREE RD | END | 452 | Deep Patch and Pave | $ 27,000 | $ 1,636,000 | |
| WATERTON CT | N PEACHTREE RD | END | 370 | Deep Patch and Pave | $ 31,000 | $ 1,667,000 | |
| WICKFORD WAY | WOMACK RD | MOUNT VERNON RD | 1762 | Deep Patch and Pave | $ 66,000 | $ 1,733,000 | AC Pipe |
| HEATHERDALE LN | COLDSTREAM DR | END | 2171 | Deep Patch and Pave | $ 103,000 | $ 1,836,000 | |
| MACBAIN LN | COLDSTREAM DR | MACLAREN CIR | 1030 | Deep Patch and Pave or FDR | $ 54,000 | $ 1,890,000 | |
| WINDON CT | HEATHERDALE LN | END | 521 | Deep Patch and Pave | $ 22,000 | $ 1,912,000 | |
| TRAILRIDGE PL | TRAILRIDGE DR | END | 614 | Deep Patch and Pave | $ 47,000 | $ 1,959,000 | Added, Supplemental |
| TRAILRIDGE PASS | TRAILRIDGE PL | TRAILRIDGE LN | 878 | Deep Patch and Pave | $ 43,000 | $ 2,002,000 | Added, Supplemental |
| TRAILRIDGE LN | HIDDEN BRANCHES DR | END | 1472 | Deep Patch and Pave | $ 82,000 | $ 2,084,000 | Added, Supplemental |
| Contingency | | | | | 17% | $ 416,000 | |
| | | | | | **2017 Total** | $ 2,500,000 | |
| **2018** | | | | | | | |
| CHAMBLEE DUNWOODY RD | COTILLION DR | PEELER RD | 3426 | Mill, Patch and Overlay 2" | $ 334,000 | $ 334,000 | Added |
| NORTH PEACHTREE RD | WELTON PL | DELVERTON DR | 2363 | Mill, Patch and Overlay 1.5" | $ 135,000 | $ 469,000 | Deferred from 2014 |
| NORTH PEACHTREE RD | DELVERTON DR | MOUNT VERNON RD | 6616 | Mill, Patch and Overlay 1.25" | $ 216,000 | $ 685,000 | AC Pipe, Deferred from 2017 |
| TILLY MILL RD | WOMACK RD | MOUNT VERNON RD | 4858 | Mill, Patch and Overlay 1.5" | $ 277,000 | $ 962,000 | Deferred from 2016 |
| WOMACK RD | CHAMBLEE DUNWOODY | VERMACK RD | 9571 | Mill, Patch and Overlay 1.5" | $ 383,000 | $ 1,345,000 | AC Pipe, Deferred from 2016 |
| WICKLIFFE CT | KINGS POINT DR | END | 264 | Deep Patch and Pave | $ 14,000 | $ 1,359,000 | Added, Supplemental |
| HAVERSTRAW DR | HUNTINGTON CIR | BROOKHURST DR | 766 | Deep Patch and Pave | $ 39,000 | $ 1,398,000 | Added, Supplemental |
| HAVERSTRAW CT | HAVERSTRAW DR | END | 178 | Deep Patch and Pave | $ 22,000 | $ 1,420,000 | Added, Supplemental |
| DUNHAVEN CT | DUNHAVEN RD | END | 261 | Deep Patch and Pave | $ 23,000 | $ 1,443,000 | Added, Supplemental |
| DUNHAVEN RD | BROOKHURST DR | E KINGS POINT CIR | 1069 | Deep Patch and Pave | $ 55,000 | $ 1,498,000 | Added, Supplemental |
| DEVEREUX CT | VERNON SPRINGS DR | END | 307 | Deep Patch and Pave | $ 22,000 | $ 1,520,000 | Added, AC Pipe |
| DAMON PL | DAMON CT | END | 251 | Deep Patch and Pave | $ 24,000 | $ 1,544,000 | Added, AC Pipe |
| DAMON CT | VERNON SPRINGS DR | END | 1050 | Deep Patch and Pave | $ 60,000 | $ 1,604,000 | Added, AC Pipe |
| BROOKE FARM DR | DUNWOODY CLUB DR | END | 4488 | Deep Patch and Pave | $ 198,000 | $ 1,802,000 | Supplemental |
| BROOKE FARM TR | BROOKE FARM DR | END | 267 | Deep Patch and Pave | $ 23,000 | $ 1,825,000 | Supplemental |
| OLD BROOKE PT | BROOKE FARM DR | END | 198 | Deep Patch and Pave | $ 13,000 | $ 1,838,000 | Supplemental |
| LITTLEBROOKE CIR | LITTLEBROOKE DR | END | 191 | Deep Patch and Pave | $ 14,000 | $ 1,852,000 | Supplemental |
| LITTLEBROOKE LN | LITTLEBROOKE DR | END | 590 | Deep Patch and Pave | $ 40,000 | $ 1,892,000 | Supplemental |
| LITTLEBROOKE TERR | BROOKE FARM DR | LITTLEBROOKE LN | 297 | Deep Patch and Pave | $ 22,000 | $ 1,914,000 | Supplemental |
| LITTLEBROOKE TR | BROOKELAKE DR | END | 548 | Deep Patch and Pave | $ 38,000 | $ 1,952,000 | Supplemental |
| OLD BROOKE LN | BROOKE FARM DR | END | 459 | Deep Patch and Pave | $ 33,000 | $ 1,985,000 | Supplemental |
| Contingency | | | | | 21% | $ 515,000 | |
| | | | | | **2018 Total** | $ 2,500,000 | |

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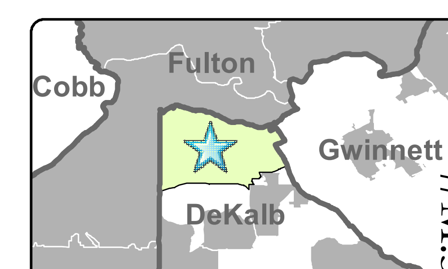
# 2014

# Paving Plan

Preventative maintenance
Scheduled Paving
Street Centerlines
City Limits



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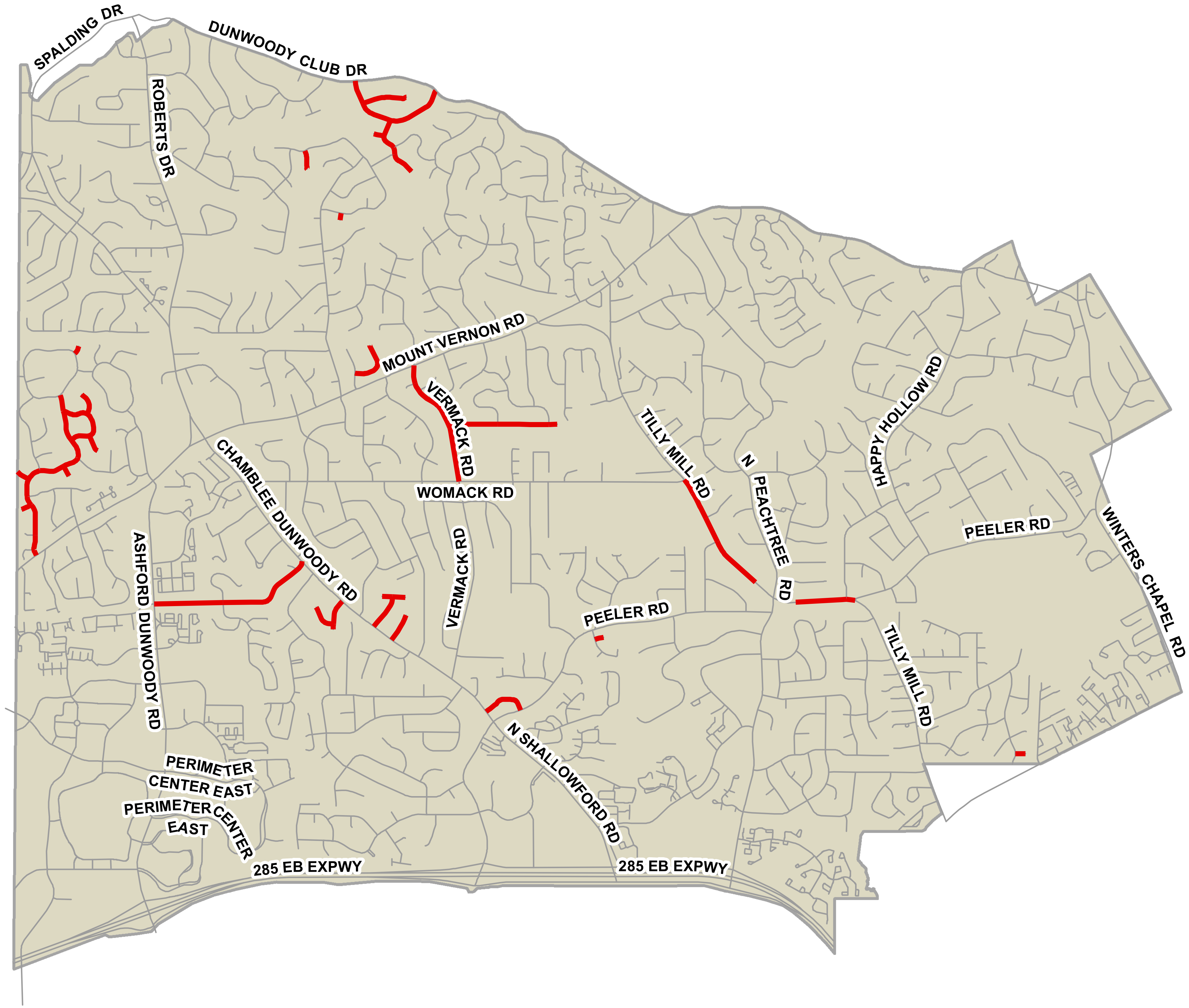


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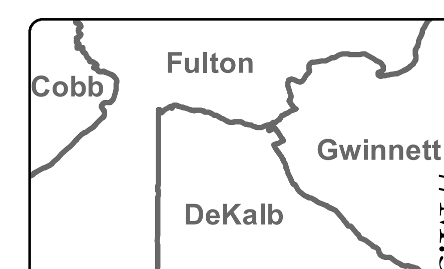
# 2015

# Paving Plan

2015_Paving
Street Centerlines
City Limits

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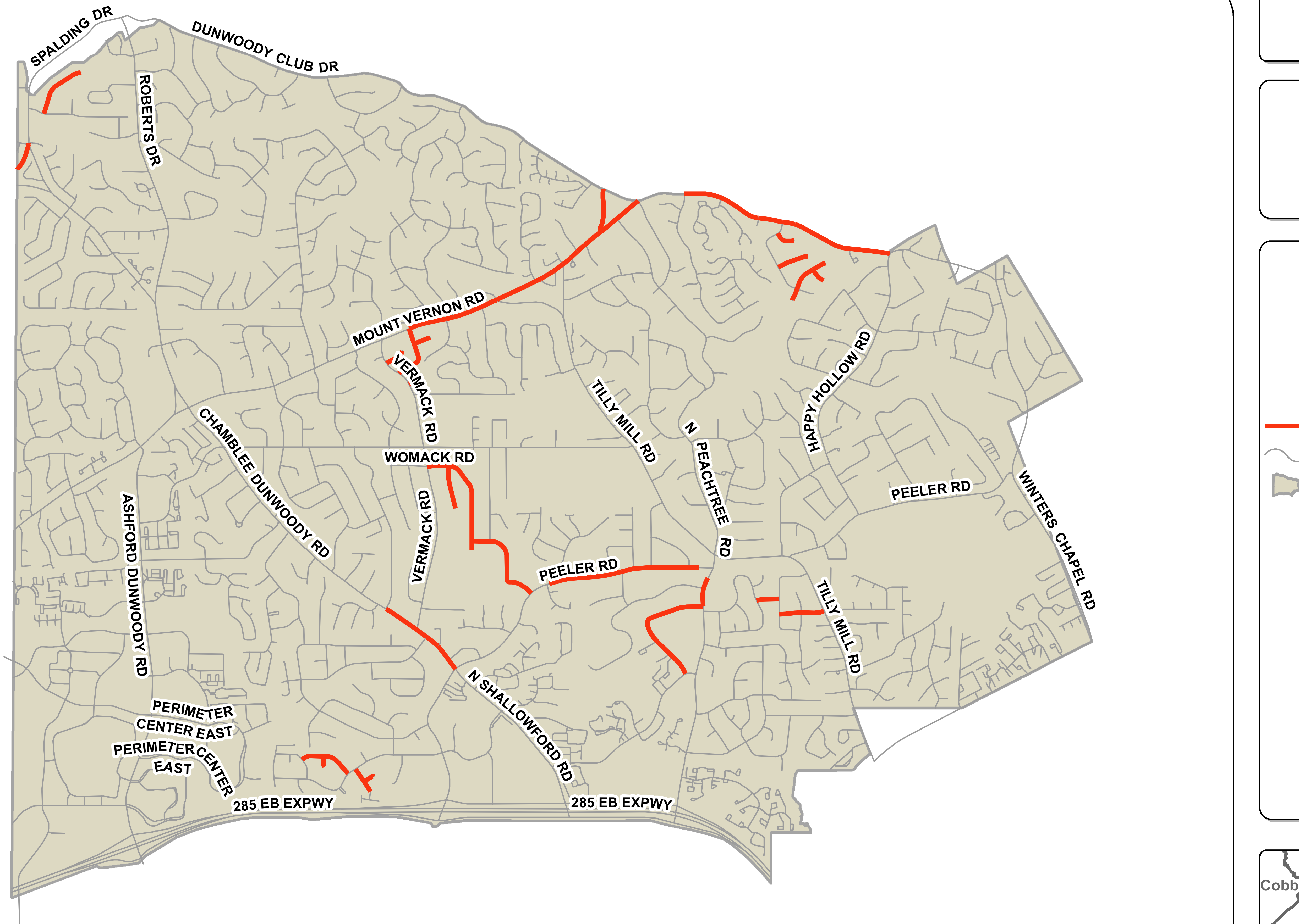
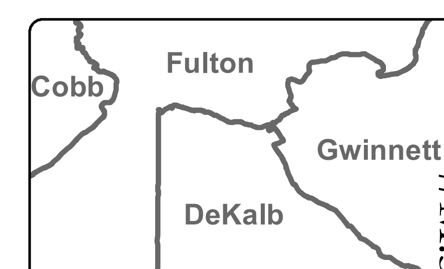
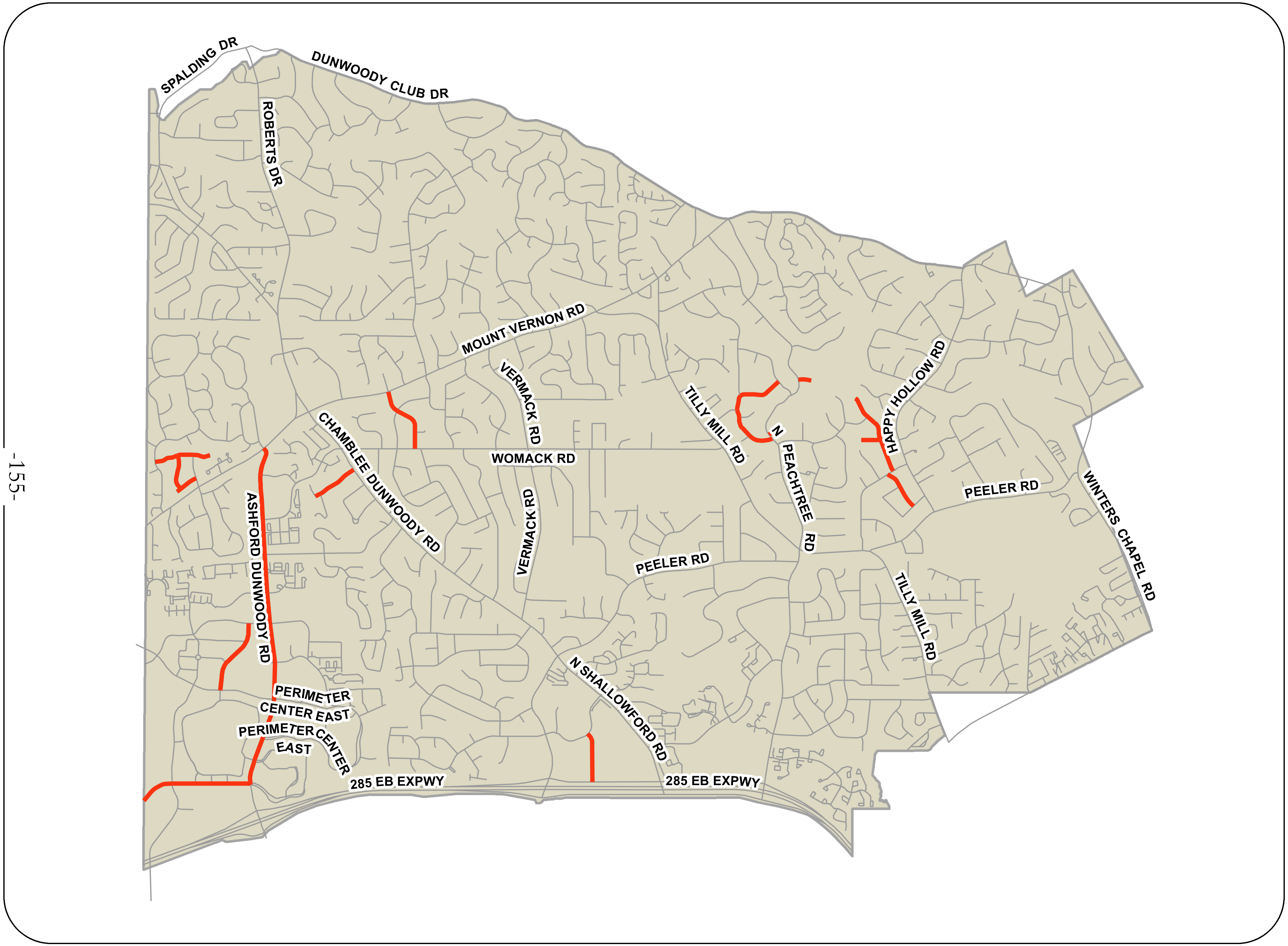
# 2016

# Paving Plan



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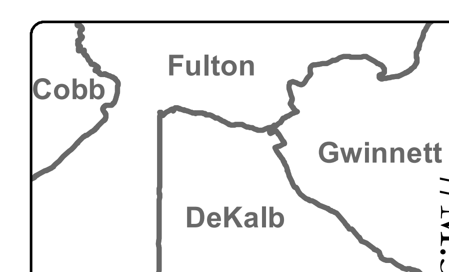
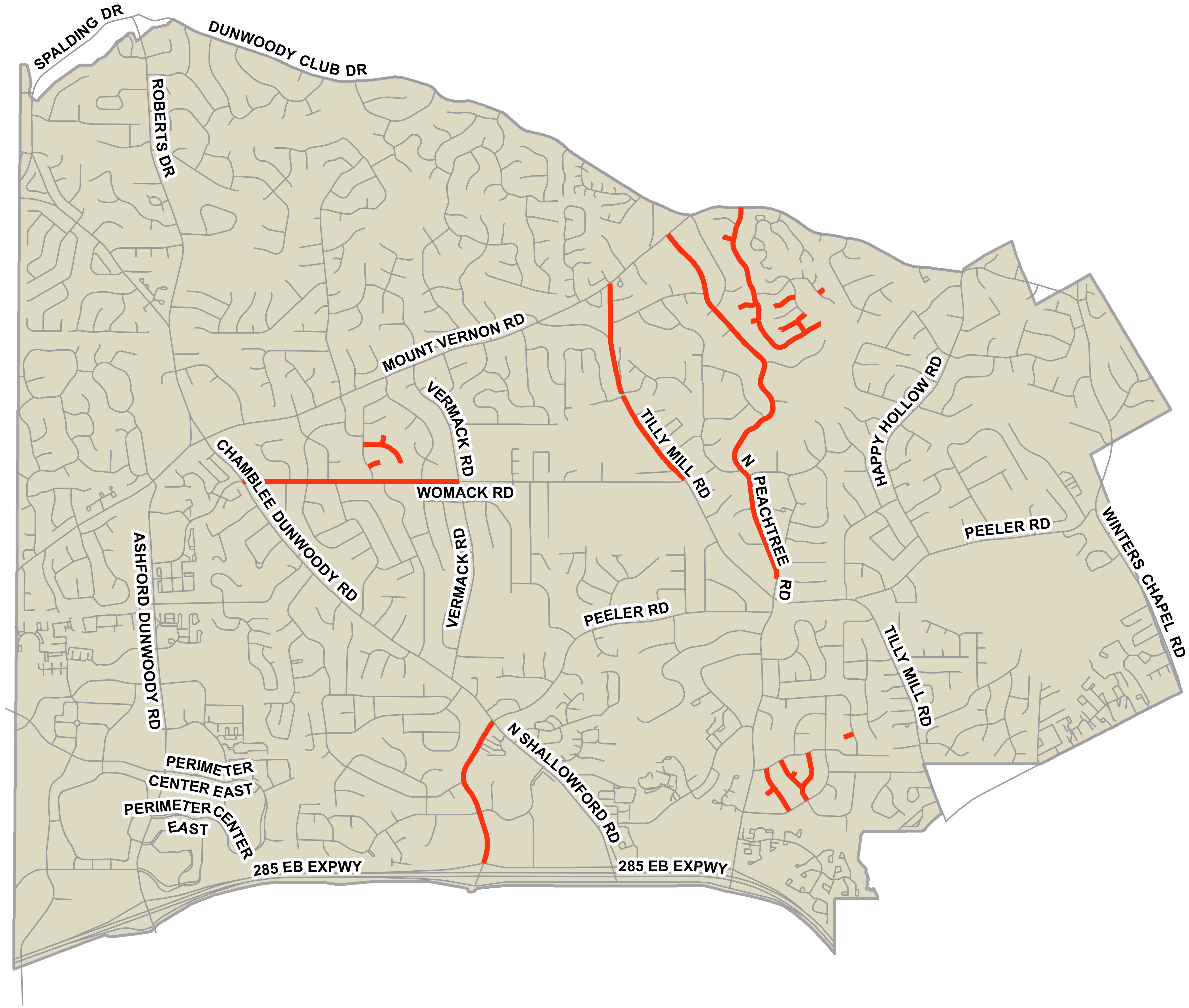
# 2017

# Paving Plan

2017_Paving
Street Centerlines
City Limits



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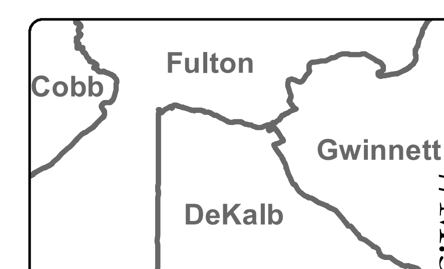
**2018**

**Paving Plan**

2018_Paving
Street Centerlines
City Limits



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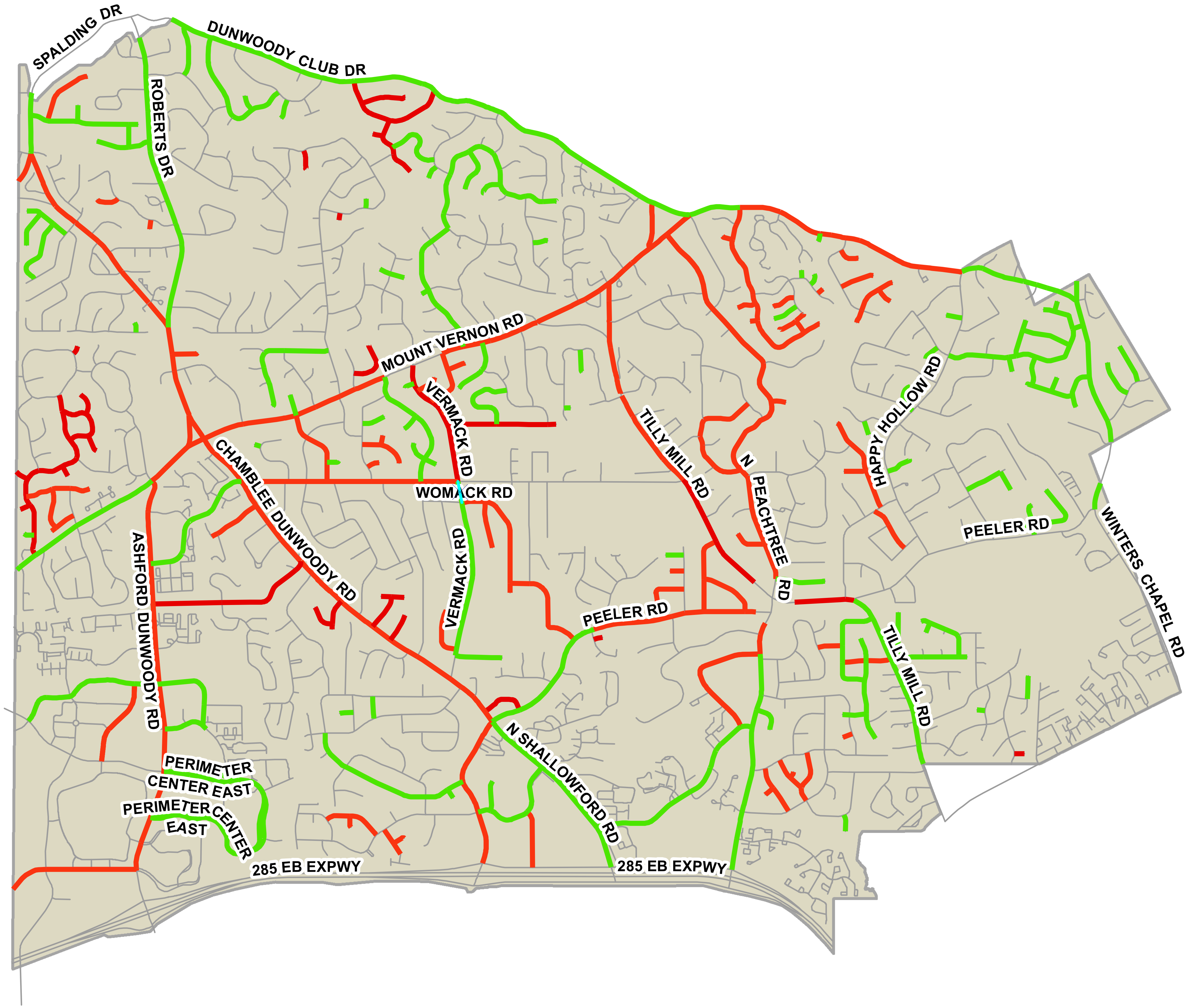
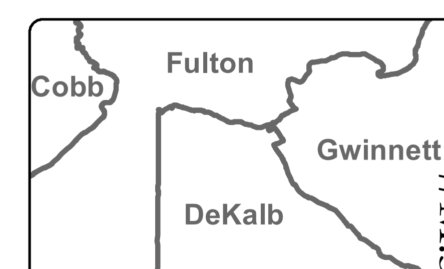
# Paving Plan




- Completed Paving
- Future Paving
- Street Centerlines
- City Limits



# CITY OF DUNWOODY, GA

## 2013 Pavement Management Report

January, 2014

Prepared By
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## List of Acronyms and Abbreviations

| Abbreviation or Acronym | Definition |
|---|---|
| $M | Dollars in millions |
| ACP | Asphalt Concrete Pavement - asphalt streets |
| ART | Arterial roadway functional classification |
| ASTM | American Society of Testing Methods |
| Brk | Break |
| CAL | Coarse Aggregate Loss |
| CDV | Corrected Deduct Value |
| COL | Collector roadway functional classification |
| Crk | Crack |
| DeflCON | Deflection Condition - structural load analysis |
| Dvdd Slab | Divided Slab |
| DynaCON | Dynamic Condition - structural layer analysis |
| ft or FT | Foot |
| ft2 or FT2 | Square foot |
| FunCL | Functional Classification |
| FWD | Falling weight deflectometer |
| GCI | Gravel Condition Index |
| GFP | Good - Fair - Poor |
| GIS | Geographic Information System |
| GISID | GIS segment identification number |
| H&V | Horizontal and Vertical |
| IRI | International Roughness Index |
| Jt | Joint |
| L&T | Longitudinal and Transverse |
| LAD | Load associated distress |
| LOC | Local roadway functional classification - same as RES |
| LOG | Lip of Gutter |
| m | metre |
| m2 | sqaure metre |
| M | Moderate |
| MaxDV | Maximum Deduct Value |
| mi or Mi | Mile |
| MnART | Minor arterial roadway functional classification |
| MOD | Moderate |
| NLAD | Non-load associated distress |
| OCI | Overall condition index, also known as PCI |
| Olay | Overlay |
| PCC | Portland Cement Concrete - concrete streets |
| PCI | Pavement Condition Index - generic term for OCI |
| R&R | Remove and replace |
| Recon | Reconstruction |
| Rehab | Rehabilitation |
| RES | Local roadway functional classification - same as LOC |
| RI or RCI | Roughness Index |
| S | Strong |
| SDI | Surface Distress Index |
| SI | Structural Index |
| STA | Station or chainage |
| Surf Trtmt | Surface Treatment |
| TDV | Total Deduct Value |
| W | Weak |

# 1.0 PROJECT DESCRIPTION

## 1.1 PRINCIPLES OF PAVEMENT MANAGEMENT

Nationwide, billions of dollars have been invested in roadway networks by municipal, state and federal governments. Locally, the City of Dunwoody has in excess of 2,444,000 square yards and 145 miles of paved roads. Preservation of existing road and street systems has become a major activity for all levels of government. There is a shortage of funds to maintain street systems at the state and local government levels. Funds that have been designated for pavements must therefore be used as effectively as possible. One proven method to obtain maximum value of available funds is through the use of a pavement management program. The PavePRO pavement management system was used for the analysis for the City of Dunwoody. Pavement management is the process of planning, budgeting, funding, designing, constructing, monitoring, evaluating, maintaining, and rehabilitating the pavement network to provide maximum benefits for available funds. A pavement management system is a set of tools or methods that assists decision makers in finding optimum strategies for providing and maintaining pavements in a serviceable condition over a given time period.

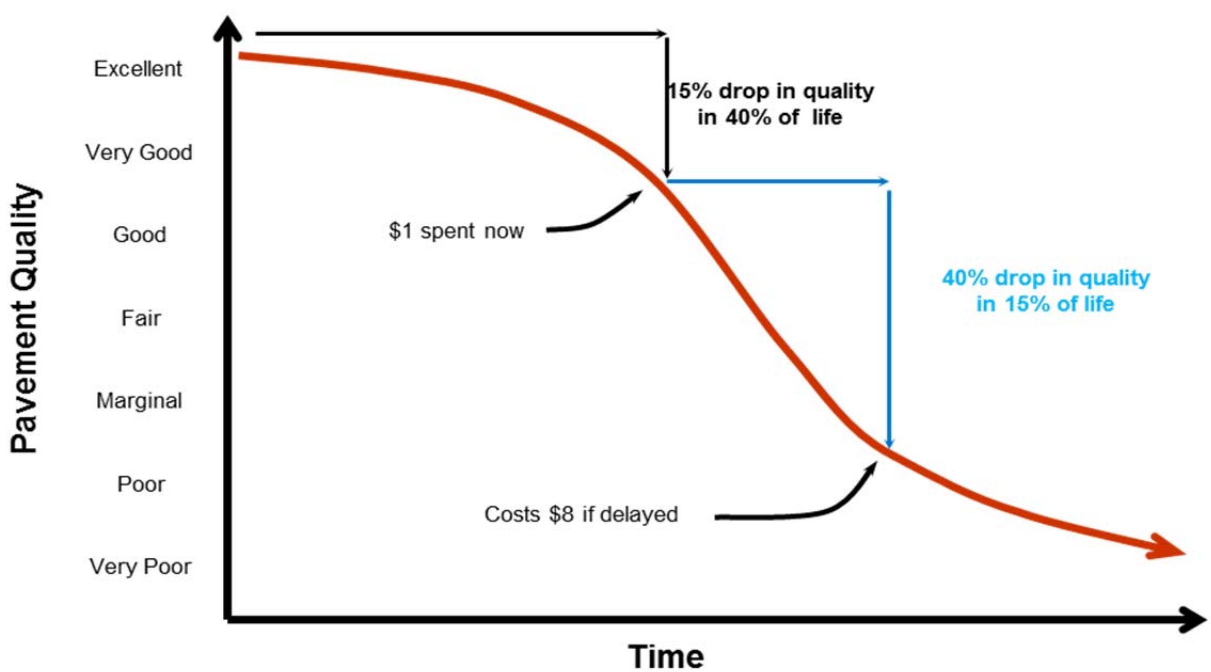


**Figure 1 – Pavement Deterioration and Life Cycle Costs**

As shown in Figure 1, streets that are repaired when they are in a good condition will cost less over their lifetime than streets that are allowed to deteriorate to a poor condition. Without an adequate routine pavement repair program, streets require more frequent reconstruction, thereby costing millions of extra dollars.

Over time pavement quality drops, until the pavement condition becomes unacceptable. The condition of each street is dependent on many factors – foremost of which are the strength or the roadway structure and traffic loading. The key to a successful pavement management program is to develop a reasonably accurate performance model of the roadway, and then identify the optimal timing and rehabilitation strategy. The resultant benefit of this exercise is realized by the long term cost savings and increase in pavement quality over time. As illustrated in Figure 1, pavements typically deteriorate rapidly once they hit a specific threshold. A $1 investment after 40% lifespan is much more effective than deferring maintenance until heavier overlays or reconstruction is required just a few years later.

Once implemented, an effective pavement management system can assist agencies in developing long-term rehabilitation programs and budgets. The key is to develop policies and practices that follow the pavement life cycle curve to delay the inevitable total reconstruction for as long as practical yet still remain within the target zone for cost effective rehabilitation.

That is, as each roadway approaches the steep part of its deterioration curve, apply a remedy that extends the pavement life - at a minimum cost, thereby avoiding costly reconstruction. Thus, the goal of a pavement management system is to identify the optimal level of funding, timing, and renewal strategy agencies should adopt to keep their roadway network at a satisfactory level of service. Figure 2 illustrates the concept of extending pavement life through the application of timely rehabilitation activities.

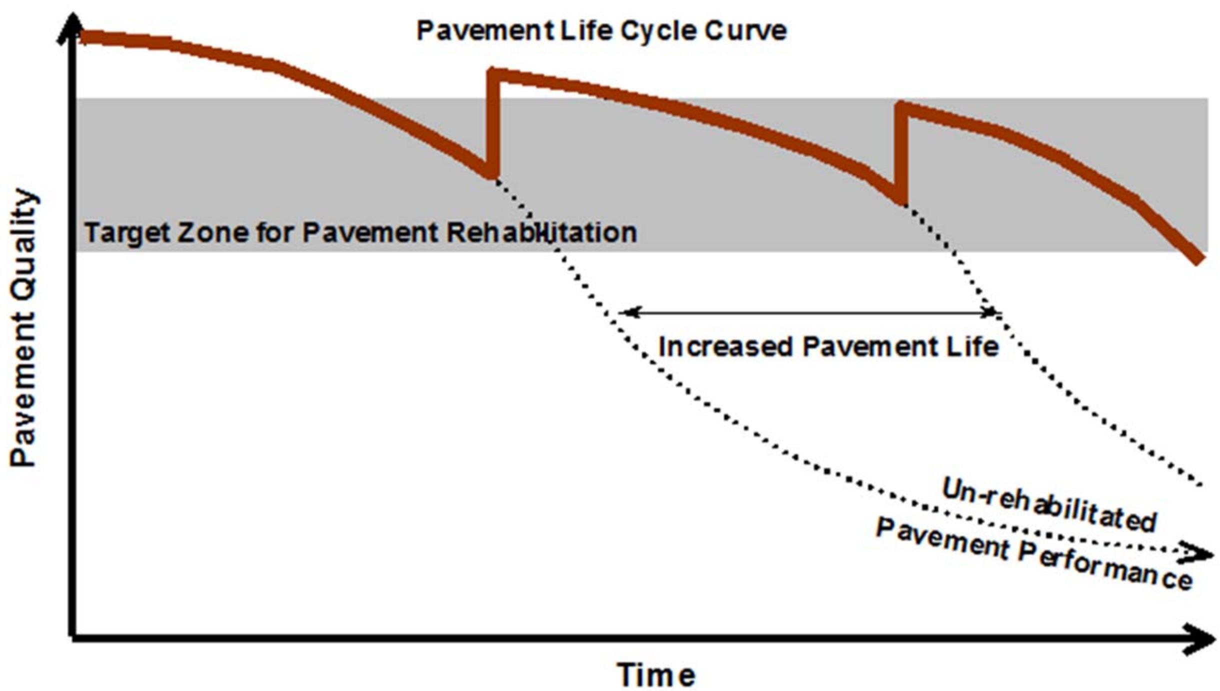


**Figure 3 – Pavement Life Cycle Curve**

Other functions of a pavement management system include:

- Provide a means to store an accurate inventory of all streets owned and or managed by the agency. An up to date inventory is a crucial foundation to a pavement management information system.
- Provide a means to store roadway and construction history including the year of rehabilitation, pre-rehab pavement condition, costs and activities.
- Assess the effectiveness of maintenance and rehabilitation strategies and new technologies.
- Provide a means to store digital images to provide a visual record of each roadway and its characteristics.

- Act as a central registry of the roadway network that can then be distributed to other utilities to provide a linkage between all right of way assets.

### 1.2 THE PURPOSE OF PAVEMENT MANAGEMENT

Agencies implement pavement management systems for a variety of reasons:

- The agency desires to use analytical tools and technologies to more effectively manage their assets. This need often comes to the forefront due to rapidly increased costs and rapidly deteriorating pavements.
- In some cases a pavement management system is required in order to qualify for various types of funding.
- The Governmental Accounting Standards Board (GASB) Statement 34 now requires agencies that collect taxes for the purpose of managing a long-term, fixed infrastructure assets to either:
    - Option #1 *(Standard Method)* - Implement financial-accounting controls to effectively depreciate and plan for replacement of fixed assets, or,
    - Option #2 *(Modified Method)* - Implement an asset management system that provides a mechanism to gauge and budget for the long-term rehabilitation/maintenance of an asset.

The study completed on the City's roadway network may be used as the basis for achieving their GASB 34 compliance. In the case of Option #1, this study may be used as the basis for the inventory and valuation of the roadway network. For Option #2, once implemented the study recommendations may form the core of the GASB 34 compliance.

### 1.3 THE PAVEMENT MANAGEMENT PROCESS

The actual pavement management process involves three unique, but important steps, and is presented graphically in Figure 4. Each activity builds on the previous, until the end result is a prioritized paving and rehabilitation program.

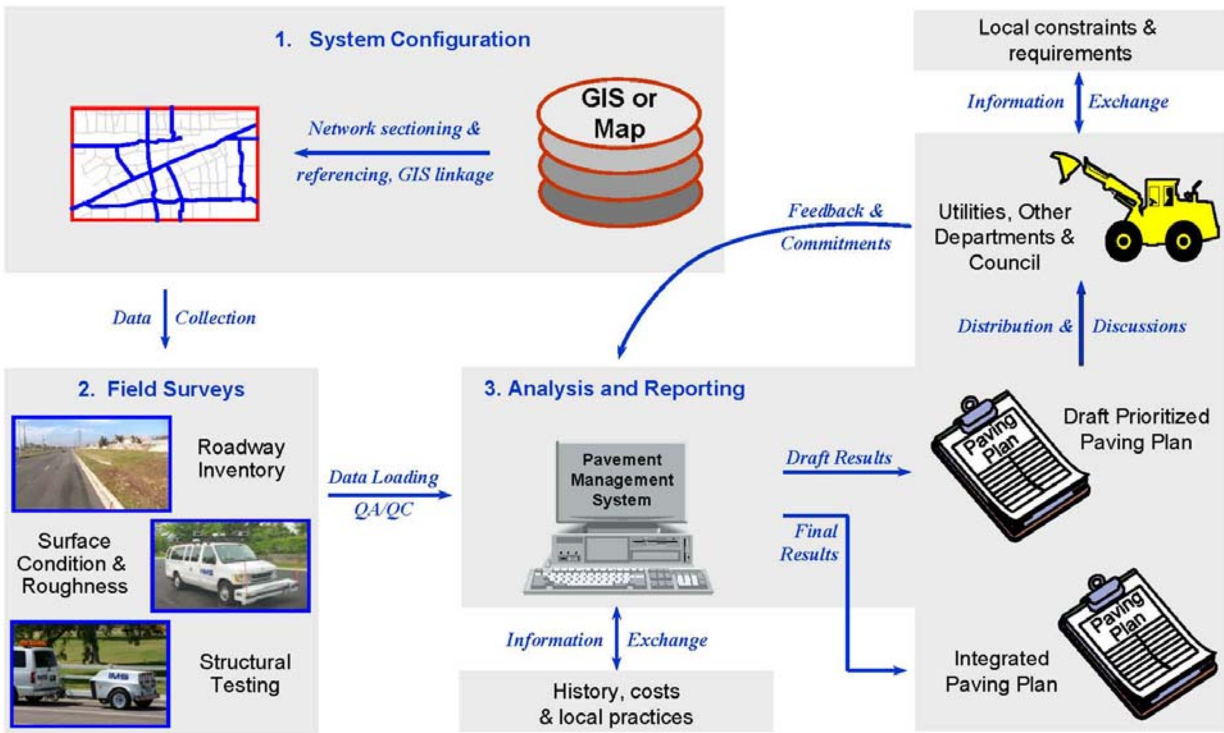


**Figure 4 - The Pavement Management Process**

The three steps are as follows;

1. **System Configuration** – this step involves identifying all roadways in the City's network, assigning them a unique identifier, listing their physical characteristics (length, width etc,) and demographic attributes (pavement type, traffic, climatic condition), and linking the network to a Geographic Information System (GIS).

2. **Field Surveys** – following a set of pre-defined assessment protocols, each roadway in the network is surveyed in order to develop a pavement condition rating or score. The following evaluation criteria are being used for the paved roadway network:

   - Roughness – a qualitative score is used to quantify the smoothness of a roadway. Roughness is measured following the industry standard "International Roughness Index" (IRI). It is an open-ended score that measures the vehicular response to traveled surface roughness and reports the value as inches/mile.
   - Rutting – measurement of wheel path rut depths by severity and length. Rut depth is a concern for two reasons – if there is insufficient cross slope, they can hold water and thus cause vehicle control problems. They also identify areas of loss of base structural strength.

- Crack Condition – used to qualify and quantify the level of cracking displayed by the road. Crack Condition consists of transverse cracking, longitudinal cracking, block cracking, and edge cracking along with other distresses. It is considered to be an important distress group in assessing the overall structural and surface condition.

All data is being collected and summarized on a block-by-block basis. Confirmation of pavement type, assessment of drainage and shoulder conditions, GPS coordinates, and digital images are also being collected as part of the field surveys.

3. **Analysis & Reporting** – Data analysis establishes the pavement condition scores. It will be completed in four separate processes as follows:

Step 1 – the results of the surface condition field surveys are being processed for loading into the pavement management software. The software uses a Cracking Condition Score, Rutting Condition Score, and a Roughness Condition Score. The Cracking Condition Score originates from the severity & extent data collected for pavement cracking and is based on a 10 to 100 scale. The Rutting Condition Score originates from the severity & extent data collected for the pavement rutting and is also based on a 10 to 100 scale. The Roughness Condition Score is an index based on the IRI value collected for the pavement and is based on a 10 to 100 scale.

Step 2 – The Cracking Condition Score, Rutting Condition Score, and Roughness Condition Score are combined to generate the Surface Condition Score using 60% of the Cracking Condition Score, 25% of the Rutting Condition Score, and 15% Roughness Condition Score.

Step 3 – In some cases, results obtained from the structural pavement assessment using either a falling weight deflectometer or a dynaflect are linked to each pavement section. The structural analysis is dependent on the traffic loading that each pavement supports, thus necessitating traffic counts percentages, including heavy trucks, for each roadway. Structural testing was not part of the 2013 testing.

Step 4 – In order to generate the Pavement Condition Index, external factors such as drainage, shoulder condition, and climate are subtracted from the Surface Condition Score. These external factors remove a maximum of fifteen points from the Surface Condition Score.

The analysis is then completed using a either a level of service based or approach in which the user specifies a target condition average and the software identifies the required budget, or a budget based approach in which fixed annual budgets are input and the software selects the streets to be rehabilitated.

Options for prioritization of candidates can be based on worst first or can include additional factors such as functional class or traffic.

## 1.4 PAVEMENT SURFACE CONDITION SURVEY

Acquiring and processing input information is the foundation of pavement management. The City of Dunwoody pavement performance data was collected using a Road Surface Tester to obtain continuous surface condition, rutting, roughness, GPS and digital image data on each of the segments of this project.

Pavement distresses that were included in the survey for asphalt roadways are as follows:

| Distress | Description |
|---|---|
| Roughness | International Roughness Index based score – an assessment of the riding comfort of the roadway converted to a 0 to 100 score. Roughness makes up 1/3 of the overall condition score. |
| Transverse Profile | Measurement of the average of rut depths along with 2 critical thresholds. |
| Transverse Cracking | Measurement of transverse cracks quantified by 5 width and 2 depth categories. |
| Longitudinal Cracking | Measurement of extent and severity of longitudinally oriented cracks. |
| Alligator Cracking | Measurement of extent and severity of load associated fatigue cracking. |
| Block Cracking | Measurement of the presence of non-load associated block/map cracking. |
| Edge Cracking | An assessment of the cracks along the roadway edge. |
| Miscellaneous Distresses | An assessment of the any other distress not identified above such as distortion, bleeding, delamination, scaling, unfilled potholes etc. |

#M.3.

### 1.5 UNDERSTANDING THE PAVEMENT CONDITION SCORE

The following illustration compares Pavement Condition Index to commonly used descriptive terms. The divisions between the descriptive terms are not fixed and may vary between functional class and pavement type. They are meant to reflect common perceptions of roadway condition.

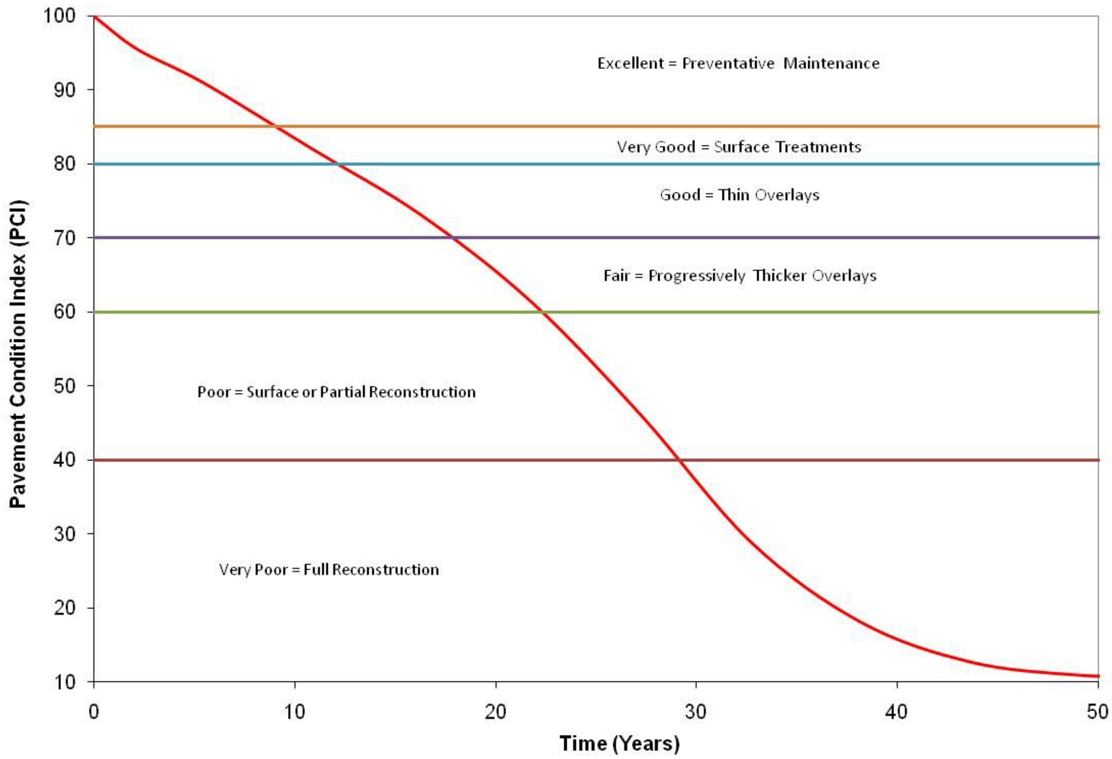


**Figure 4 – Understanding the Pavement Condition Index Score**

The general idea of what these condition levels mean with respect to remaining life and typical rehabilitation actions is included in the following table:

| PCI Range | Description | Relative Remaining Life | Definition |
|---|---|---|---|
| 85 – 100 | Excellent | 15 to 25 Years | Like new condition – little to no maintenance required when new; or routine maintenance such as crack and joint sealing. |
| 80 – 85 | Very Good | 12 to 20 Years | Routine maintenance such as patching, crack sealing with possible surface treatments - chip seals, seal coats, slurries or micro-surfacing. |
| 70 – 80 | Good | 10 to 15 Years | Heavier surface treatments and thin overlays. Localized panel replacements. |
| 60 – 70 | Fair | 7 to 12 Years | Progressively thicker overlays with localized repairs. Moderate to extensive panel replacements. |
| 40 – 60 | Poor | 5 to 10 Years | Sections will require very thick overlays or surface replacement, base reconstruction and possible subgrade stabilization. |
| 10 – 40 | Very Poor | 0 to 5 Years | High percentage of full reconstruction. |

# 2.0 PAVED NETWORK CONDITION AND FINDINGS

## 2.1 ROADWAY SECTIONS INVESTIGATED

The intent of this study was to develop a network level management program for the paved roadway system of Dunwoody. At the time of the survey, the network consisted of 147 centerline miles of roadway, broken down into 4 functional classes. Roadways are only asphalt pavement (AC).

| | Total Network | Arterial | Collector | Minor Collector | Local |
|---|---|---|---|---|---|
| **Length (ft):** | 2,454,148 | 473,854 | 293,153 | 132,771 | 1,554,370 |
| **Length (Mi):** | 145.4 | 20.1 | 8.7 | 13.1 | 103.5 |
| **Number of Block Sections:** | 1,551 | 300 | 206 | 85 | 961 |
| **Area ($yd^2$):** | 2,454,148 | 473,854 | 293,153 | 132,771 | 1,554,370 |
| **Percentage of Network:** | | 19.3 | 11.9 | 5.4 | 63.3 |

The following plot summarizes the total network by area split between functional classifications.

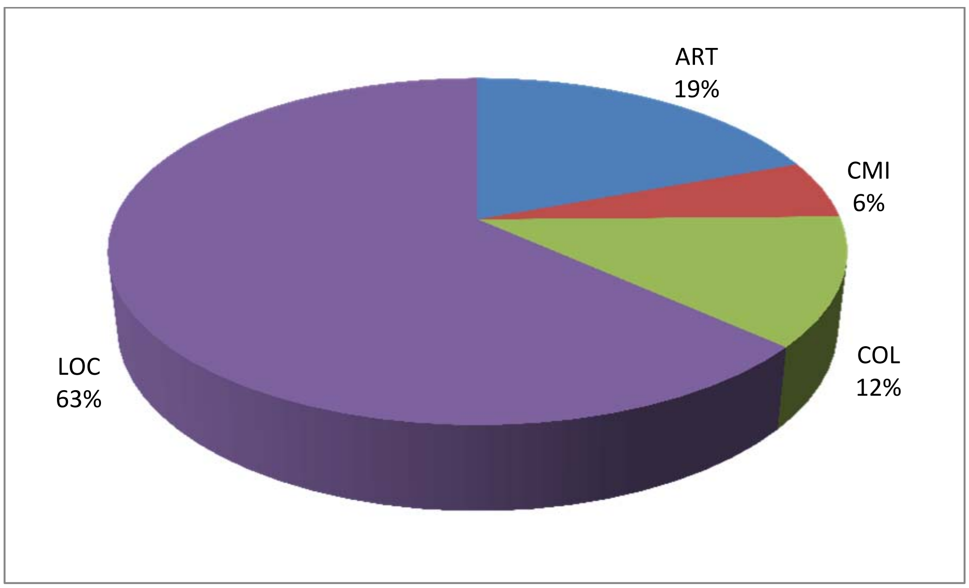


**Figure 5 – Network Split by Functional Classification by Pavement Area**

## 2.2 NETWORK PRESENT CONDITION

The street network owned or managed by the City of Dunwoody consists of approximately 147 centerline miles of pavement. At the time of testing, the average condition of the paved network was 69, with streets ranging from a low of 33 to a high of 97.

Figure 6, presented below shows distribution of pavement condition for the roadway network in the City of Dunwoody on a 10 to 100 scale, 10 being worst and 100 being best condition. The roadway network displays atypical pavement condition characteristics when compared to other agencies of similar size and environment. Typically a more uniform bell shape curve – centered on streets in the 60 to 80 range is encountered. In this case there are many street centered around the 40 to 70 range with an additional large group in the 100 to 85 range. This may represent the recent work done on many of major streets but, still shows many streets that are still in need of repair.

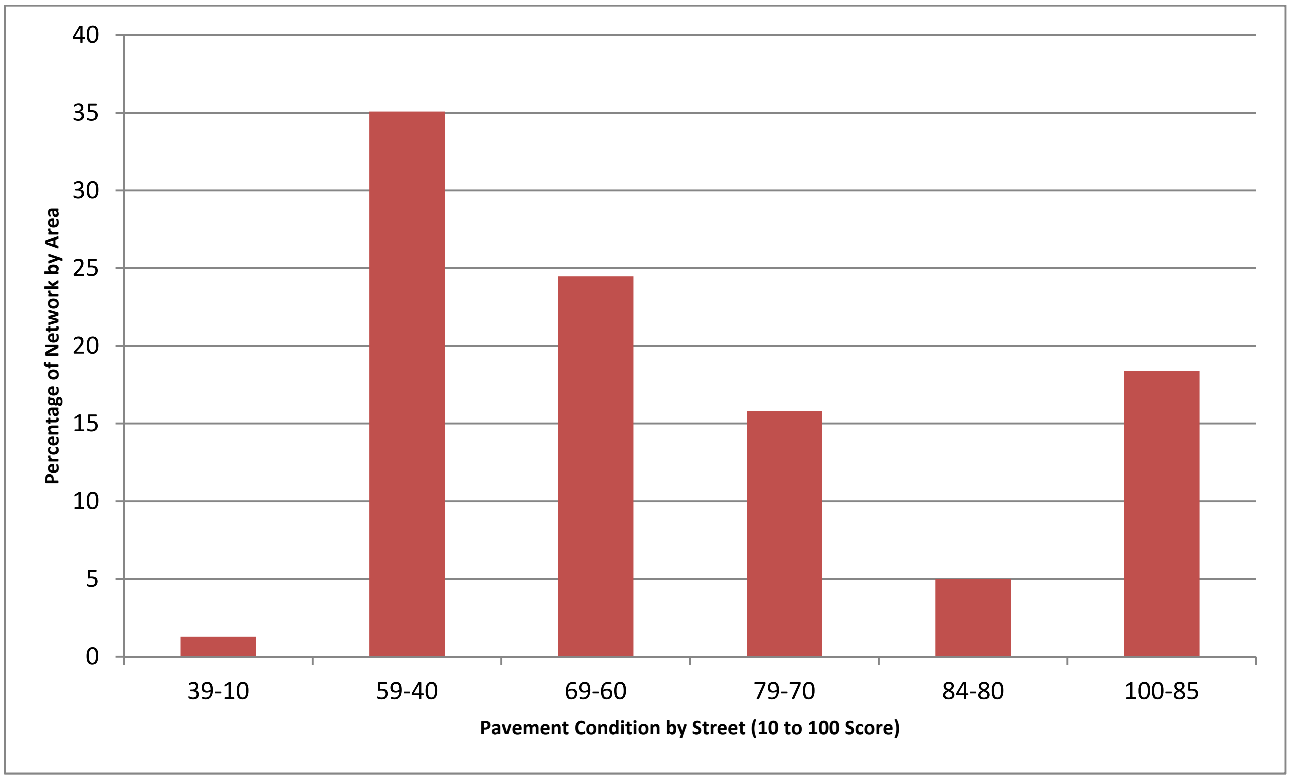


**Figure 6 – Paved Network Present Status**

The following graph (figure 7) plots the same pavement condition information, but instead of using the actual pavement condition index value, descriptive terms are used to classify the roadways. From the chart, 18% of the network can be considered in excellent condition with a PCI score greater than 85. These are the like new roads and only require routine maintenance such as minor patching and some crack sealing. On a typical network, 10% to 15% of the roads are generally rated as excellent. Furthermore, 5% of the City of Dunwoody network falls into the very good classification. These are roads that benefit the most from preventative maintenance techniques such as micro- surfacing, slurry seals and localized repairs. If left untreated these roadways will drop in quality to become overlay candidates.

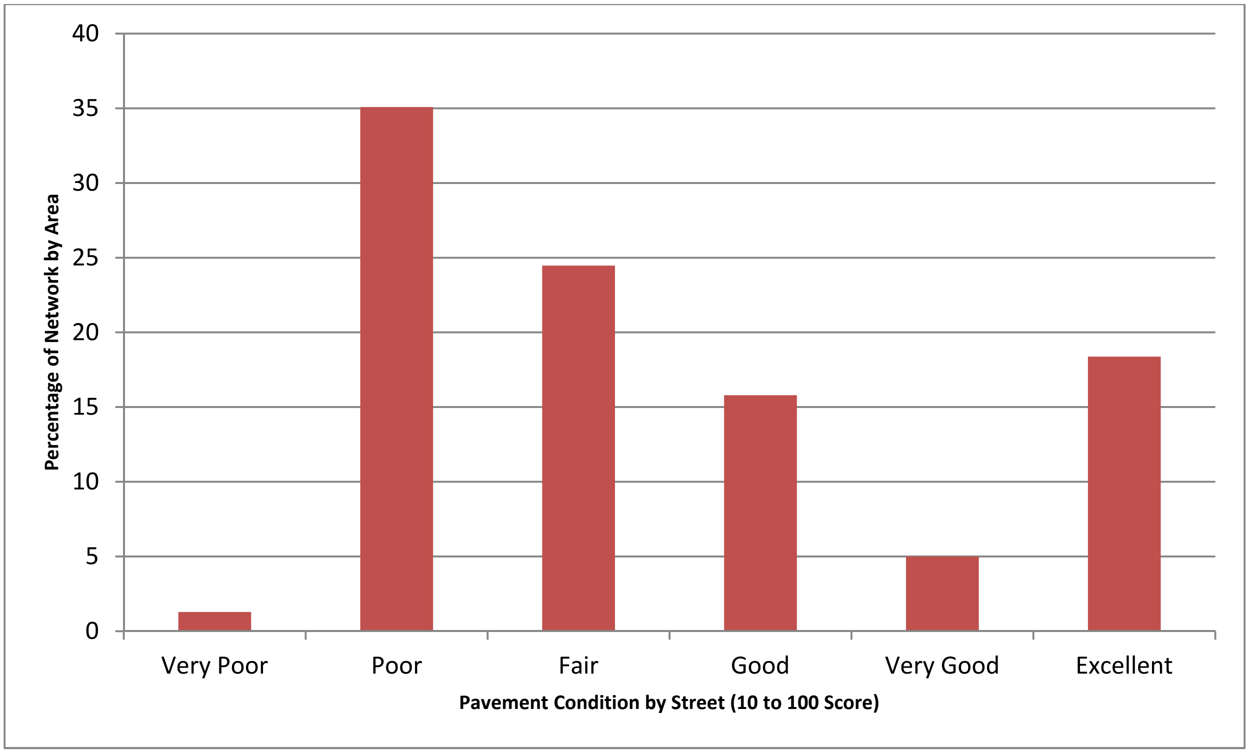


**Figure 7 – Network Pavement Condition by Descriptive Classification**

40% of the network can be considered in "good" or "fair" condition, representing candidates for progressively thicker overlay based rehabilitation.

***These pavements are beginning to deteriorate at an accelerated rate. Some of them can be saved by resurfacing in the near future. Delay would increase the cost of repair significantly for these pavements. In that sense, they are the 'optimal' pavements for repair. If left untreated, they will decline rapidly into reconstruction candidates.***

The remaining 36% percent of the network is rated as "poor" or "very poor", meaning these roadways have failed or are past their optimal due point for overlay based rehabilitation and may require progressively heavier or thicker forms of rehabilitation (such as surface reconstruction) or total reconstruction. Roadways falling progressively into the poor and unacceptable categories (PCI less than 60), should be considered the City's "backlog" of immediate work to do. These are the roadways that require rehabilitation efforts, in thicker depths, or reconstruction.

### 2.3 PRESENT CONDITION BY FUNCTIONAL CLASS

The following plot presents the present condition broken down in major roadways (arterials and non-residential collectors) and minor roadways (residential streets and residential collectors).

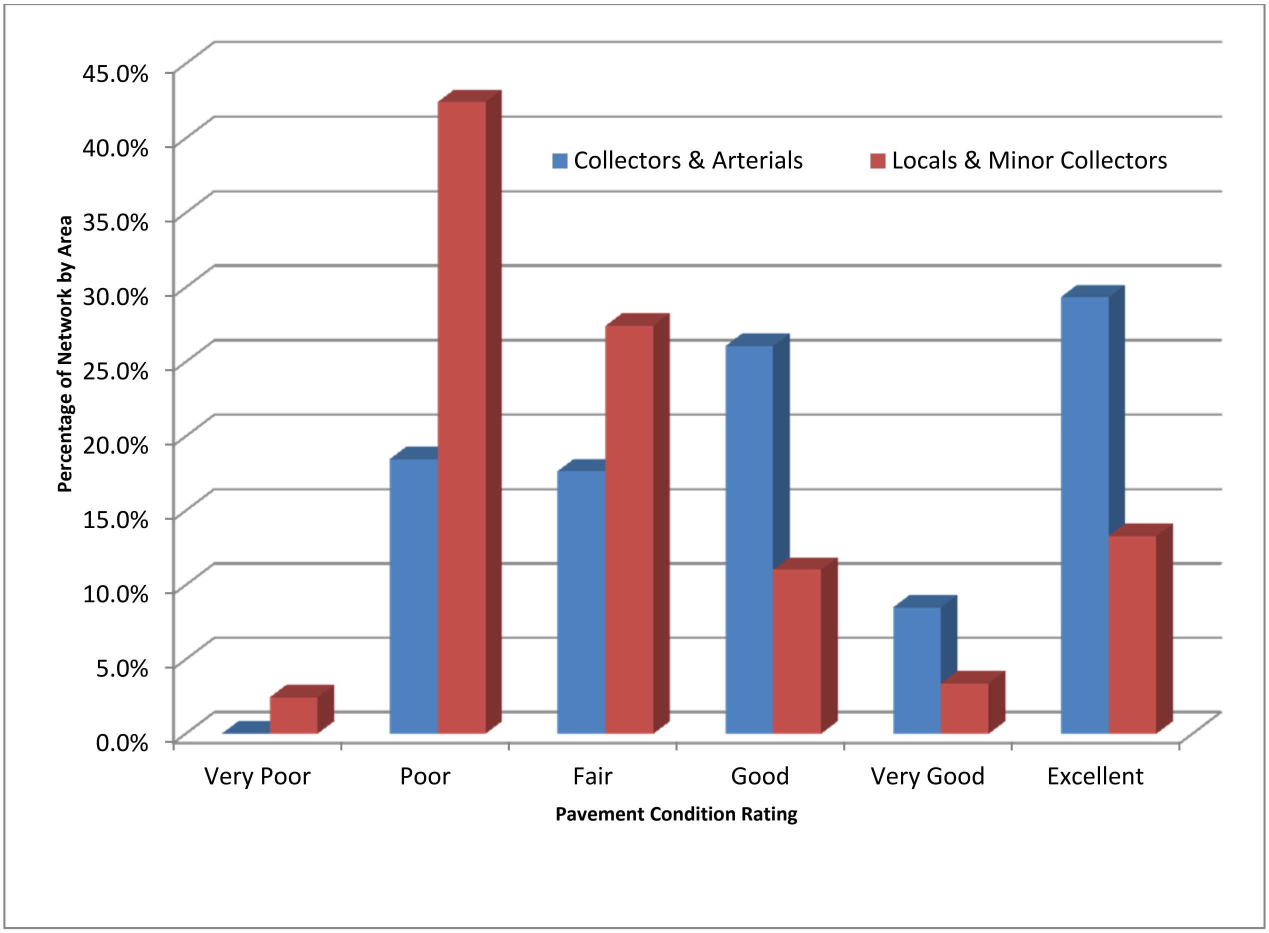


**Figure 8 - Network Pavement Condition by Functional Class**

As can been seen from the plot, both the major and minor networks display different condition characteristics, with the major network in better condition with fewer poor roads.

### 2.4 RECONSTRUCTION BACKLOG

Backlog roadways are those that have dropped in quality such that surface based rehabilitation efforts would no longer prove to be cost efficient and require either partial or total reconstruction. Backlog is expressed as the percentage of roads requiring reconstruction as compared to the network totals.

***The concept of pavement condition index (PCI) score and backlog must be fully understood in order to develop an effective pavement management program. The PCI score indicates the overall pavement condition and represents the amount of equity in the system and is the value most commonly considered when gauging the overall quality of a roadway network. It may also be used to define a desired level of service – that is an agency may wish to develop a pavement management program such that in 5 years the overall network score meets a set minimum value. It is the backlog however, that defines the amount of work an agency is facing and is willing to accept in the future. Further, it is the combination of the two that presents the true picture of the condition of a roadway network, and conversely defines improvement goals.***

Generally a backlog of 10% to 20% of the overall network is considered manageable from a funding point of view – a target value of less than 15% would be considered ideal. A backlog below 10%, while certainly desirable from a service perspective, may represent a non-optimal expenditure of funds if rehabilitation dollars are limited. Backlogs approaching 20% and above tend to become unmanageable unless aggressively checked through larger rehabilitation programs.

With the City of Dunwoody's current reconstruction backlog at 36%, the City's objectives need to focus on developing an effective overlay and backlog reduction program to minimize the number of roadways that will deteriorate into reconstruction candidates and at the same time reduce the backlog to a manageable level.

# 3.0 REHABILITATION PLAN AND BUDGET DEVELOPMENT

## 3.1 PAVEMENT MANAGEMENT METHODS

All pavement management systems require user inputs in order to establish real world budgets and rehabilitation plans. The keys among these inputs are:

- Whether to be a budget driven or level of service driven agency.
- Whether to focus on doing a worst first or prioritized based rehabilitation plan.
- Length of design period – either 5 or 10 years
- Desired level of service at the end of the design period.
- Desired backlog at the end of the design period.

There are many ways to manage a given pavement network. The pavement management program used for the City of Dunwoody has two general methods that can be run with different parameters to achieve a variety of scenarios. The first method, called "Level Analysis", allows the user to select a desired level of service to maintain while the program reports the associated annual budget. In this method the average condition of the network is brought to a selected level by rehabilitating streets from low condition to high condition. However, the streets are not usually done in a worst first order. Instead, the cost benefit of each strategy is considered so that an optimum strategy at an optimum time can be performed. The second method, called "Budget Analysis", allows the user to select a fixed budget for each year while the program reports the associated level of service. In this method the streets are selected optimally while staying within the budget constraints. In some cases the optimum strategy or the timing of rehabilitation for a particular street will be altered to fit within a particular budget. Each of the above inputs affects the final budget and rehabilitation program in a variety of manners.

## 3.2 REHABILITATION UNIT RATES

The base costs and assumptions used to develop the rehabilitation unit rates are as follows:

- No allowances for City overhead, landscaping, signage, or signal improvements.
- 15% allowance for traffic control, engineering and inspections and contingencies.
- Minimum overlay thickness = 1.5", maximum overlay thickness = 3.5". Milling will be selected on-site and either be edge or full width.
- No allowance for ADA compliance or sidewalk improvements.
- $0.25/yd2 allowance for striping and pavement markings.
- Restrict local roads to surface based rehabilitation – "Deep Patch and Pave".

| Rehabilitation | Arterials ($/yd2) | Collectors ($/yd2) | Minor Collectors ($/yd2) | Residential ($/yd2) |
|---|---|---|---|---|
| Surface Treatments (slurries/microsurfacing) | 3.25 | 3.00 | 2.75 | 2.75 |
| 1.0" Mill and 1.5" AC Overlay | 12.75 | 12.25 | 11.75 | 11.75 |
| 1.5" Mill and 2.0" AC Overlay | 13.25 | 12.75 | 12.25 | 12.25 |
| 2.0" Mill and 2.5" AC Overlay | 13.75 | 13.25 | 12.75 | 12.75 |
| 2.5" Mill and 3.0" AC Overlay | 14.25 | 13.75 | | |
| 3.0" Mill and 3.5" AC Overlay | 14.75 | | | |
| Deep Patch and Pave | | 16.75 | 15.75 | 15.75 |
| Full Reconstruction | 50.75 | 45.00 | | |

### 3.3 DO NOTHING, FIX ALL AND BUDGET ANALYSIS COMPARISON

The following plot presents the “Fix All” and “Do Nothing” options against the present condition.

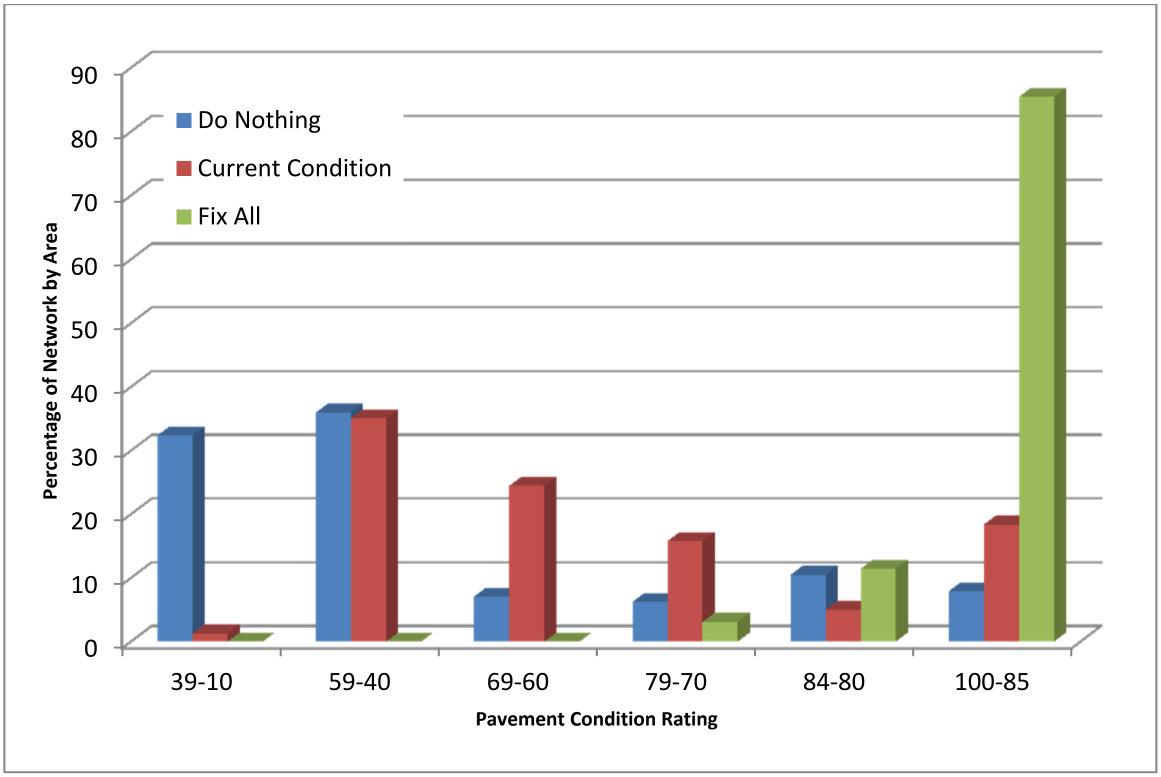


**Figure 9 – Do Nothing and Fix All Options Compared Against Current Condition**

The cost to theoretically rehabilitate all roadways in the City of Dunwoody, to a like new condition is approximately $33.8M and results in a network PCI score of 84 with no backlog (new pavement is considered to be between 85 and 95). This assumes unlimited funding is available and all roadways are rehabilitated in their optimal year. Obviously this is an unreasonable expectation for level of service and funding, however it does identify an upper limit of potential expenditure.

It is projected that if no rehabilitation or maintenance is done, the network PCI will drop from its current level of 66 to 53 within 5 years and increase the backlog to 68%.

The net gain in network average condition for the Fix All option is 22 points (88 – 66 = 22). Dividing this gain into the Fix All total of $33.8M yields approximately $1.5M per point gained. Thus the Do Nothing option can be estimated to remove over $19M in equity from the system {(66-53)*1.5 = 19.5}, while the cost to maintain the network at a 66 is only $11.5M.

### 3.4 BUDGET ANALYSIS

A total of 10 budget scenarios were assessed for Dunwoody. The starting PCI is for 2014 and the Final PCI is 2018. The results of the 10 programs are plotted in figure 10 and presented in the following table.

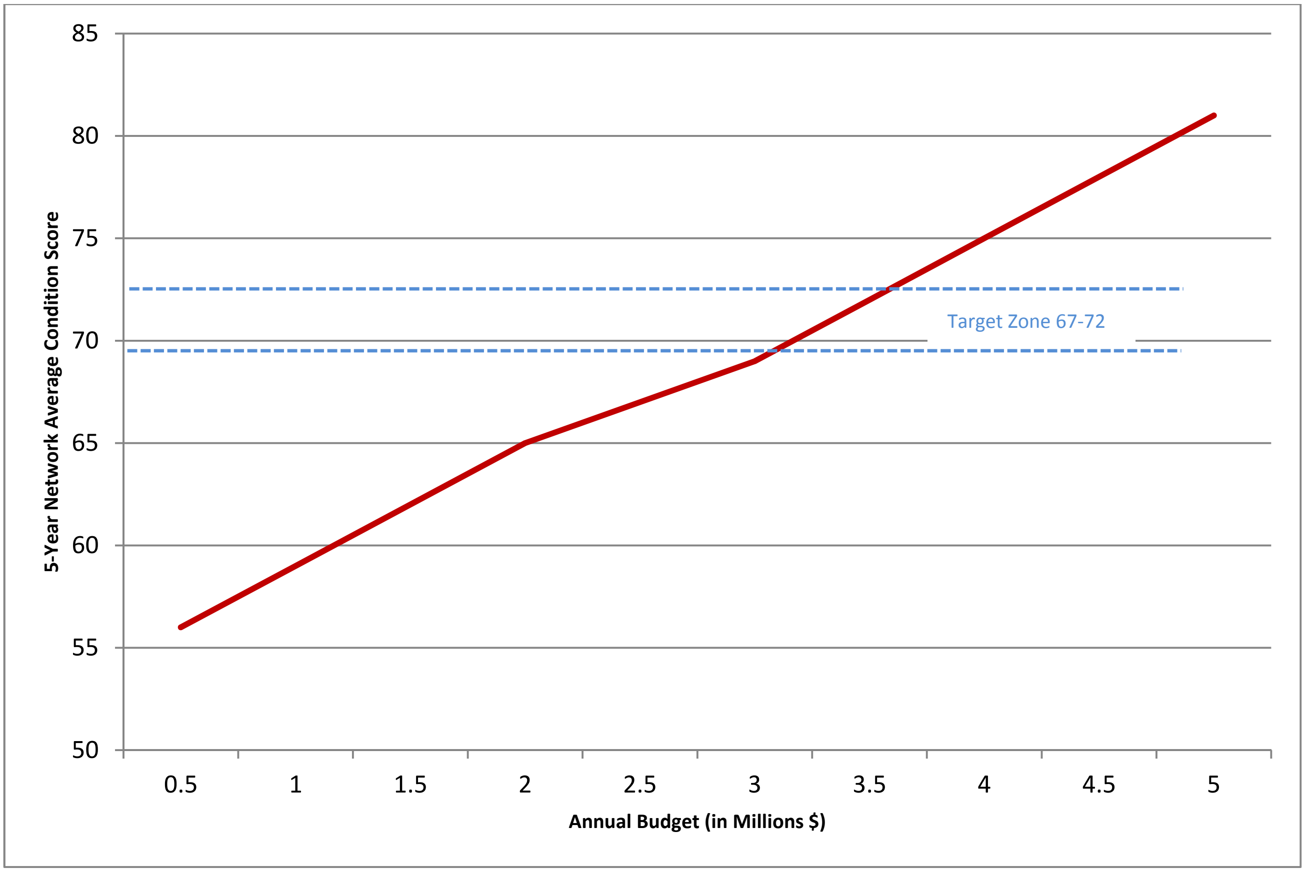


**Figure 10 – Annual Budget Versus 5 Year Network Average Pavement Condition Index**

| Budget Scenario | Starting PCI | Annual $ | Final PCI | PCI Change | Final Backlog |
|---|---|---|---|---|---|
| Do Nothing | 66 | 0 | 53 | -13 | 68 |
| $2.1 Million | 66 | 2.1 | 65 | -1 | 47 |
| $2.5 Million | 66 | 2.5 | 67 | 1 | 44 |
| Fix All | 66 | 6.8 | 88 | 22 | 0 |

***Annual budgets of $ 2.1million and $2.5 million dedicated to roadway rehabilitation were run. The results of these budget runs are included in the appendix of this report.***

### 3.5 NETWORK RECOMMENDATIONS AND COMMENTS

The following recommendations are presented to City of Dunwoody as an output from the pavement analysis, and must be read in conjunction with the attached reports.

1. The as-measured pavement condition score at year end 2013, as well as the current network average score for the city is 66. The backlog is 36%.
2. Dunwoody has made significant improvements since the 2009 testing. There is significant work still to be done. The City should adopt a policy identifying the desired level of service and acceptable amount of backlog. We suggest a PCI target above 70, with a backlog of no more than 15%.
3. The City should review the recommended program to aggregate stretches of road that have differing years of rehabilitation but are in close geographic proximity to each other.
4. Any streets that are to be rehabilitated due to widening or underground utility repairs should be added to the scenarios as "Must Do" streets.
5. The City should continue a proactive approach to pavement management, focusing on early intervention and maintaining their existing investments in pavements. This would allow the City to maintain the quality of their system with little increase in backlog – in order to achieve this with limited funding, some reconstruction candidates may get postponed in favor of multiple overlay projects.
6. The full suite of proposed rehabilitation strategies should be reviewed prior to finalization of these budgets as they can have a large effect on the analysis. This analysis focused on the primary activities of slurry seals, overlays and reconstruction. The City may wish to expand the overlay strategies to include progressively thicker overlays based on decreasing PCI scores.
7. GASB 34 compliance may be achieved by adopting the recommendations and budget contain herein.
8. The City should consider developing an ongoing program to maintain the pavement and right of way asset management system such that it can continue to be used to effectively manage the City's roadway assets. Maintenance of the asset management system should consist of:
   - Updating the pavement condition information either every 3 years, or completing 1/3 of the network annually. This will allow the City to update their roadway inventory, GIS data and pavement condition data on a routine basis.
   - An estimated budget of $125 to $150/mile (inclusive of surface distress data collection and processing, and data loading) may be used to cover the annual surveys.

***The analyses and recommendations presented in this report are based upon the data obtained from the Client and other information discussed in this report. This report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted pavement engineering practices. No warranty, expressed or implied, is provided. In the event that any information furnished to us, as outlined in this report, is inaccurate or changes, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions of this report modified or verified in writing by the pavement engineer.***