DEPARTMENT OF TRANSPORATION

STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE Pavement Design

OFFICE Materials and Testing
Forest Park, Georgia

DATE January 26, 2018

FROM Monica L. Flournoy, P.E., State Materials Engineer

TO Brent A. Story, P.E., State Design Policy Engineer

SUBJECT **Guidelines for Minor Pavement Projects**

The Office of Materials and Testing (OMAT) recommends the attached Guidelines for Minor Pavement Projects replace all previously published guidelines related to pavement sections for minor projects.

These guidelines are applicable for all non-interstate roads with a design year two-way average daily traffic (ADT) less than or equal to 10,000 vehicles per day (vpd), a design year two-way average daily truck traffic (ADTT) less than or equal to 1,000 vpd, and a maximum of 475 total daily loadings. The total daily loadings shall be calculated using the assumptions and equations provided in these guidelines. In addition, the guidelines should be used for pavement work constructed by permit within the GDOT right-of-way.

In general, all routes that meet the criteria of these guidelines should use 9.5 mm Superpave, Type II as the asphaltic concrete surface course. However, roundabout sections on routes that meet the criteria of these guidelines should use 12.5 mm Superpave with polymer modified asphaltic cement as the asphaltic concrete surface course.

The guidelines are for immediate implementation. Where projects meet the minor pavement project criteria and pavement designs reflect the appropriate pavement section in the guidelines, pavement designs shall not require review and approval by the State Pavement Engineer.

Alternately for designs that meet all criteria of the guidelines, the Design Phase Leader may prepare pavement designs using the current GDOT Pavement Design Tool, for submission by the Project Manager to OMAT for review and approval by the State Pavement Engineer.

Pavement Evaluation Summary (PES) reports are still required for projects when recommended in the Plan Development Process (PDP) Manual. For projects that meet the guidelines and require a PES, the Design Phase Leader should prepare pavement full-depth designs using the current GDOT Pavement Design Tool, for submission by the Project Manager to OMAT for review and approval by the State Pavement Engineer. Using the GDOT Pavement Design Tool in lieu of these guidelines could result in a thinner and more cost effective design than what is provided in these guidelines.

Furthermore, for projects that meet the guidelines and where recommended by the PES report, the Design Phase Leader should prepare pavement overlay designs using the current GDOT Pavement Design Tool, for submission by the Project Manager to OMAT for review and approval by the State Pavement Engineer.

If additional information is needed, please contact Ian Rish at (404) 608-4849 (Direct) or (404) 608-4770 (Main).

MLF:JTR:IDR

Attachments: Guidelines for Minor Pavement Projects

Concurs: _____
Marc Mastronardi, P.E., Director of Construction

Recommends: _____
Hiral Patel, P.E., Director of Engineering

Approves: _____
Meg Pirkle, P.E., Chief Engineer

GUIDELINES FOR MINOR PAVEMENT PROJECTS

Criteria for use of the Minor Pavement Project Guidelines (MPPG):

- Non-interstate roadways that require up to a 20-year design life
- Design Year Two-Way ADT $\leq$ 10,000 vehicles per day (vpd)
- Design Year Two-Way ADTT $\leq$ 1,000 vpd
- Total Daily Loadings (TDL) $\leq$ 475

The use of the guidelines requires the following information:

- Traffic data that has been approved by GDOT.
- The soil support value (SSV) and regional factor (RF) for the project. If available, the SSV should be taken from the Soil Survey Summary Report. If the Soil Survey Summary Report is unavailable, the SSV should be taken from the "Georgia Map for Regional Factors, Typical Soil Support Values, and 'k' Values."
- The calculated TDL for each pavement thickness to be designed. The TDL can be calculated manually or by use of the current Guidelines for Minor Pavement Projects Tool. In the calculation of the TDL, the following assumption and equations shall be used:
  - Lane Distribution Factor (LDF) = 1.0
  - Design Year One-Way ADTT = (Design Year One-Way ADT) * (24-Hour Truck %)
  - 18-Kip ESAL Factor = (S.U. Truck %) ÷ (24 Hour Truck %) * 0.40 + (M.U. Truck %) ÷ (24 Hour Truck %) * 1.50
  - TDL = (Design Year One-Way ADTT) * (LDF) * (18-Kip ESAL Factor)

Example of the Manual Calculation of the Total Daily Loadings (or Daily ESALs)

Given:

Design Year One-Way ADT = 5,000 vpd
24-Hour Truck % = 10%
S.U. Truck % = 5%
M.U. Truck % = 5%
LDF = 1.0 } Default

Design Year One-Way ADTT = (Design Year One-Way ADT) * (24-Hour Truck %)
Design Year One-Way ADTT = (5,000) * (10%)
Design Year One-Way ADTT = 500 vpd
18-Kip ESAL Factor = (S.U. Truck %) ÷ (24 Hour Truck %) * 0.40 + (M.U. Truck %) ÷ (24 Hour Truck %) * 1.50
18-Kip ESAL Factor = (5%) ÷ (10%) * 0.40 + (5%) ÷ (10%) * 1.50
18-Kip ESAL Factor = 0.95
TDL = (Design Year One-Way ADTT) * (LDF) * (18-Kip ESAL Factor)
TDL = (500 vpd) * (1.0) * (0.95)
TDL = 475 *(Note: this is also the maximum TDL possible under these Guidelines.)*

Explanation of the MPPG Pavement Sections

- The attached map for RF and typical SSV provides historical values that have been successfully used in the design of pavement sections by the Department. This map can be used when no Soil Survey Summary has been prepared.
- From Table 1, the recommended MPPG pavement section is obtained given the SSV, RF, and calculated TDL. For example, the recommended section for a road with a SSV = 4.0, RF = 1.7, and calculated TDL = 475 is MPPG Pavement Section C-8.
- Table 2 and Table 3 indicate that MPPG Pavement Section C-8 is equivalent to an asphaltic concrete pavement thickness of 8.25 inches and 8.50 inches, respectively. The hyphenated number indicates the recommended graded aggregate base (GAB) thickness, which for this example is 8 inches.

GUIDELINES FOR MINOR PAVEMENT PROJECTS

Table 1: Minor Pavement Project Guideline Pavement Sections

Soil Support Value	Regional Factor	Total Daily Loadings	MPPG Pavement Section
4.5	1.6	≤ 328	A-8
		329 to 475	B-8
4.0	1.6 to 1.7	≤ 201	A-8
		202 to 329	B-8
		330 to 475	C-8
	1.4 to 1.5	≤ 228	A-8
		229 to 372	B-8
		373 to 475	C-8
3.5	2.0	≤ 188	A-10
		189 to 300	B-10
		301 to 472	C-10
		473 to 475	D-10
	1.7 to 1.8	≤ 209	A-10
		210 to 334	B-10
		335 to 475	C-10
	1.4 to 1.6	≤ 235	A-10
		236 to 375	B-10
		376 to 475	C-10
3.0	2.4	≤ 102	A-10
		103 to 163	B-10
		164 to 256	C-10
		257 to 397	D-10
		398 to 475	E-10
	2.0	≤ 122	A-10
		123 to 195	B-10
		196 to 307	C-10
		308 to 475	D-10
	1.7 to 1.8	≤ 136	A-10
		137 to 217	B-10
		218 to 342	C-10
		343 to 475	D-10
	1.5 to 1.6	≤ 153	A-10
		154 to 244	B-10
		245 to 384	C-10
		385 to 475	D-10
	1.4	≤ 175	A-10
		176 to 279	B-10
		280 to 439	C-10
		440 to 475	D-10

Soil Support Value	Regional Factor	Total Daily Loadings	MPPG Pavement Section
2.5	2.2 to 2.4	≤ 109	A-12
		110 to 172	B-12
		173 to 266	C-12
		267 to 406	D-12
		407 to 475	E-12
	1.8 to 2.0	≤ 131	A-12
		132 to 206	B-12
		207 to 319	C-12
		320 to 475	D-12
	1.5 to 1.6	≤ 164	A-12
		165 to 258	B-12
		259 to 399	C-12
		400 to 475	D-12
2.0	2.0	≤ 85	A-12
		86 to 134	B-12
		135 to 208	C-12
		209 to 317	D-12
		318 to 475	E-12
	1.6 to 1.8	≤ 95	A-12
		96 to 149	B-12
		150 to 231	C-12
		232 to 352	D-12
		353 to 475	E-12

Table 2: MPPG Pavement Section Codes for Asphaltic Concrete Pavement Thicknesses (Excluding Roundabout Sections)

MPG Pavement Section Code	Total Asphaltic Concrete Thickness (inches)	9.5 mm SP Type II*	19mm SP	25mm SP
A	6.25	1.25	2	3
B	7.25	1.25	2	4
C	8.25	1.25	2	5
D	9.25	1.25	2	6
E	10.25	1.25	2	7

*For ADT < 4,000 vpd, use pay item number 402-3102.
For 4,000 vpd ≤ ADT ≤ 10,000 vpd, use pay item number 402-3103.

Table 3: MPPG Pavement Section Codes for Asphaltic Concrete Pavement Thicknesses (Roundabout Sections)

MPG Pavement Section Code	Total Asphaltic Concrete Thickness (inches)	12.5 mm SP w/ Polymer Modified AC	19mm SP	25mm SP
A	6.50	1.50	2	3
B	7.50	1.50	2	4
C	8.50	1.50	2	5
D	9.50	1.50	2	6
E	10.50	1.50	2	7

Georgia Map Showing

Regional Factors (RF) , Typical Soil Support Values (SSV) and 'k'-Values