Deficient Bridges Technical Memorandum

Douglas County
Comprehensive Transportation Plan

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INTRODUCTION

Bridges are critical links in the roadway network and in the consideration of safety and capacity. The County and the Georgia Department of Transportation (GDOT) have successfully maintained bridges throughout the County. Though challenges are felt nationwide, consistent and reliable inspection and planning have prevented accidents and kept the County bridges effectively in operation.

BRIDGE INVENTORY

The GDOT Bridge Maintenance Office conducts periodic inspections on structures and prepares a Bridge Conditions Report every two years. The report includes a National Bridge Inspection rating known as the sufficiency rating. On a scale of 0 to 100, a bridge is considered deficient and in need of rehabilitation/replacement when its score is 50 or below. Another indicator is the age of a structure. While the age alone does not determine a bridge's condition, most structures are designed for a 50-year lifespan. The Douglas County bridge data was obtained from GDOT. The inventory includes location, facility type, size, length, year built, and sufficiency rating.

Table 1 presents the structures (countywide) that either have a sufficiency rating at 50 or below and those structures approaching or exceeding 50 years in age. The bridge locations are shown in Figure 1. Seven bridges, highlighted in bold text, are considered deficient: State Route 166 at Anneewakee Creek, Anneewakee Creek Road at Anneewakee Creek, North County Line Road at Interstate 20, Lee Road at Interstate 20, Burnt Hickory Road at Interstate 20, Mason Creek Road at Mobley Creek Tributary, West Tyson Road at Keaton Creek Tributary, and Stockmar Road at Mud Creek. Nine additional structures are approaching or exceeding 50 years in age.

Bridge at Dog River

Table 1 – Existing Bridges of Concern

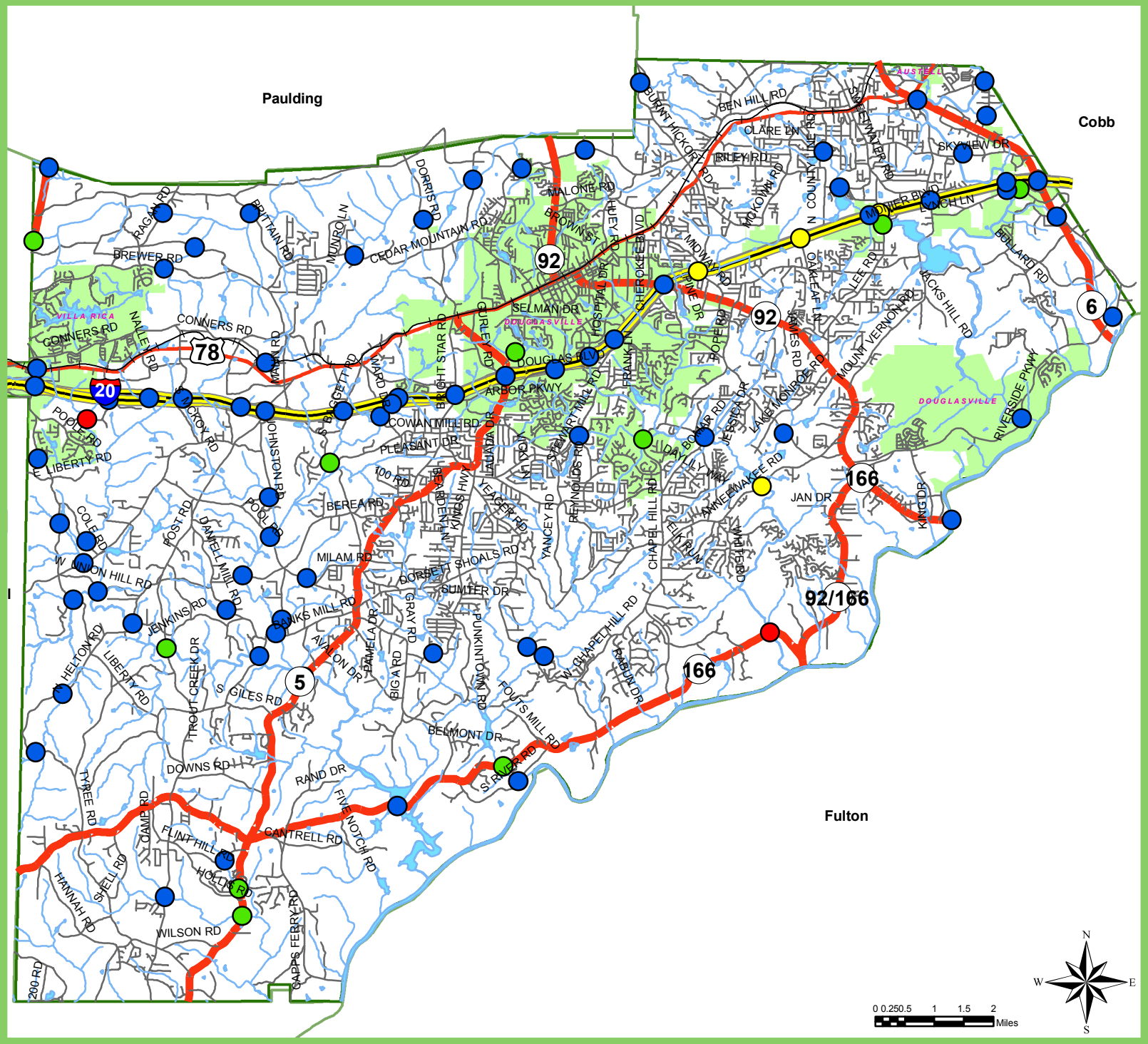
Facility Carried	Feature Intersected	Year Built	Sufficiency Rating
Bill Arp Road	Hurricane Creek	1956	98.49
Bill Arp Road	Hurricane Creek Tributary	1956	98.49
State Route 61	Mud Creek	1937	89.69
State Route 166	Bear Creek	1957	67.64
State Route 166	Anneewakee Creek	1957	**33.54**
Anneewakee Creek Road	Anneewakee Creek	1963	**48.69**
North County Line Road	Interstate 20	1963	**37.89**
Bridge Road	Sweetwater Creek Tributary	1958	64.40
Lee Road	Beaver Run Creek	1958	87.76
Lee Road	Interstate 20	1962	**47.38**
Rose Avenue	Anneewakee Creek	1955	90.06
Chapel Hill Road	Anneewakee Creek	1949	85.33
Burnt Hickory Road	Interstate 20	1962	**41.93**
Mason Creek Road	Mobley Creek Tributary	1936	**12.25**
West Tyson Road	Keaton Creek Tributary	1956	**21.16**
Post Road	Dog River	1951	52.53

Source: GDOT Bridge Maintenance Office, August 2007.

DOUGLAS COUNTY, GEORGIA COMPREHENSIVE TRANSPORTATION PLAN

Bridge Locations and Sufficiency Status

Figure 1



Legend

- Sufficient
- Low Sufficiency
- Low Sufficiency and Older than 50 years
- Older than 50 years
- INTERSTATE
- STATE
- US Hwy
- Other
- Lake/Pond
- City Limits
- County Boundary

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CURRENTLY FUNCTIONALLY OBSOLETE BRIDGES

Functional obsolescence happens when functional and geometric-based appraisal ratings are below the current standard. Structural deficiencies and functional obsolescence are mutually exclusive. Structural deficiencies will take precedence where ratings classify a bridge as both structurally deficient and functionally obsolete. Based on the bridge rating data from Georgia Department of Transportation, a total of 5 bridges (5.7%) in Douglas County, shown in Table 2, are identified as functionally obsolete bridges.

Table 2 – Current Functionally Obsolete Bridges

Facility carried	Location	Sufficiency rating	Year constructed	Functional classification
Prestley Mill Road	At SW Douglasville C.L.	51.39	1962	Minor arterial street
SR 166	8.5 miles south of Douglasville	67.64	1957	Minor arterial street
Bridge Road	8.2 miles east of Douglasville	64.40	1958	Minor arterial street
Post Road	5 miles south of Villa Rica	52.53	1951	Minor collector
Anneewakee Creek Road	4.8 miles SE of Douglasville	48.69	1963	Collector Street

All of the functionally obsolete bridges in Douglas County are at least 45 years old. Some functionally obsolete bridges also have certain structural inadequacy, which needs to be upgraded. For example, the 2-lane bridge carrying Post Road over Dog River requires a replacement of the steel superstructure due to its insufficient flexural capacity.

CURRENT STRUCTURALLY DEFICIENT BRIDGES

All of the structurally deficient bridges in Douglas County have a sufficiency rating below 50, which means that relevant maintenance should be given as a priority. A strong correlation between the sufficiency rating and structural deficiency is evidenced. The majority of structurally deficient bridges in Douglas County are functionally categorized local roads. For those currently structurally deficient bridges, posting is required to restrict the traffic loading so that the public safety is protected. Based on the bridge rating data from Georgia Department of Transportation, a total of 5 bridges (5.7%) in Douglas County, shown in Table 3, are identified as structurally deficient bridges.

Table 3 – Current structurally deficient bridges				
Facility carried	**Location**	**Sufficiency rating**	**Year constructed**	**Functional classification**
North County Line Road	4.2 miles east of Douglasville	37.89	1963	Local road
SR 166	7 miles southeast of Douglasville	33.54	1957	Minor arterial street
Burnt Hickory Road	2.5 miles east of Douglasville	41.93	1962	Collector Street
Mason Creek Road	4.8 miles southwest of Douglasville	12.25	1936	Local road
West Tyson Road	0.5 mile SE of Villa Rica	21.16	1956	Local road

Overall, 7.0 percent of Georgia's bridges were structurally deficient and 13.0 percent were functionally obsolete in 2006. The bridge conditions in Douglas County are above the state average.

FUTURE STRUCTURALLY DEFICIENT AND FUNTIONALLY OBSOLETE BRIDGES

As indicated above, there is a strong correlation between the sufficiency rating and structural deficiency. Figure 2 shows the sufficiency rating distribution of the current bridges. Seven out of the total 87 bridges (8.0%) in Douglas County are rated below 50 in terms of sufficiency. Five of the seven bridges are classified as structurally deficient. Most of the functionally obsolete bridges have sufficiency ratings below 65.

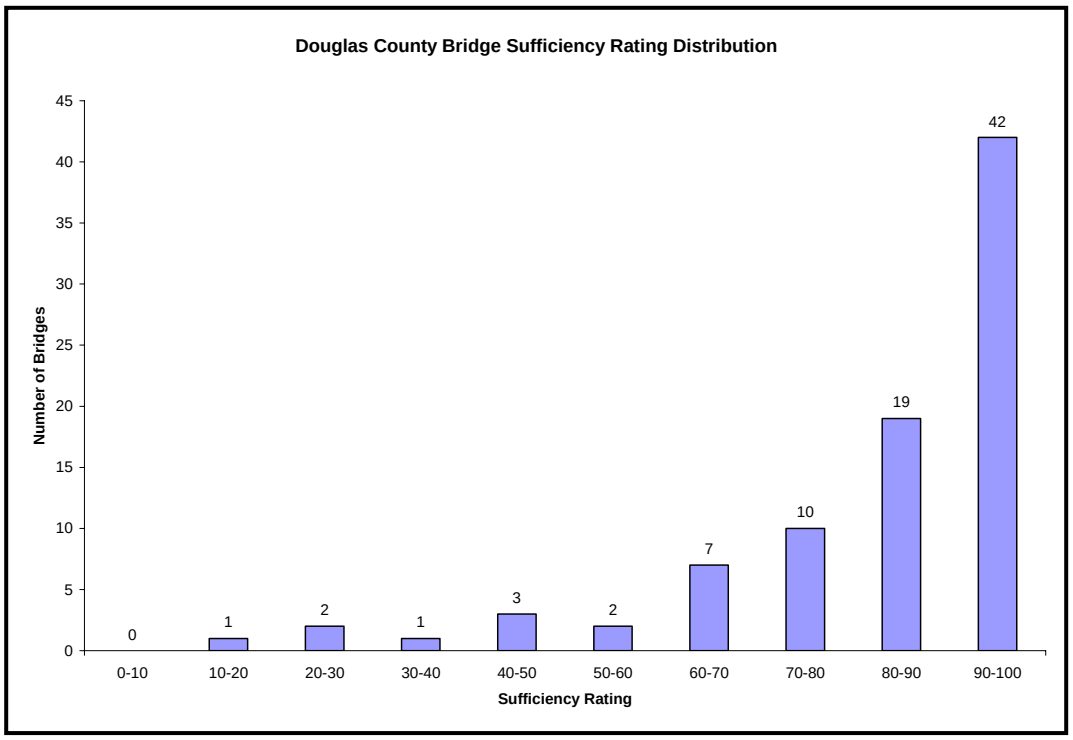

Figure 2 – Sufficiency rating distribution

Therefore, it is reasonable to assume that, in the future, the bridges which will first fall into either structurally deficient or functionally obsolete categories are most likely the ones with a current sufficiency rating below 65. Hence, in addition to the listed bridges above, it is recommended that resources be given to the following bridges as a priority:

Table 4 – Potentially structurally deficient or functionally obsolete bridges

Facility carried	Location	Sufficiency rating	Year constructed	Functional classification
Lee Road	5.5 miles east of Douglasville	47.38	1962	Minor arterial street
Ragan Road	2.5 miles northeast of Villa Rica	61.83	1993	Local road
SR 92	East of Douglasville	61.89	1962	Minor arterial street
Thornton Road	7.0 miles northeast of Douglasville	63.53	1963 (Reconstructed in 1991)	Other principal arterial