A typical example of the county's newer construction is this four-span, precast, prestressed concrete I-beam structure—the T.C Jester Road Bridge over Harris County Flood Control Ditch.

HARRIS COUNTY, TEXAS EXPERIENCE WITH CONCRETE BRIDGES

by Jackie Freeman and Willard Puffer, Harris County, Texas

Harris County, Tex., which includes Houston, is the third most populous county in the United States with an estimated 4.1 million residents in June 2009. The county's population has increased 19% since 2000. The unincorporated population of Harris County is approximately 1.4 million. The county would become the sixth largest city in the nation if it were a single incorporated city. The county's land area, 1778 square miles, is larger than Rhode Island and Connecticut combined.

Harris County's road network consists of approximately 5900 miles of roads and 696 bridges (44 additional bridges are coming into service pending scheduled inspections). Approximately 60% of the road network is residential, with the remaining 40% either collector roads or thoroughfares. Sixty percent of the road network is reinforced concrete pavement, with asphalt and other materials comprising the remaining pavement types.

The material of the county's bridges is almost exclusively concrete. The breakdown by materials of the main span is shown in Table 1. Seventy-seven percent of the inventory is precast, prestressed concrete multiple box girders (64%) and concrete culverts (13%).

Ninety percent of the county's bridge inventory crosses water. Twenty-two bridges are at least 50 years old. In 2007, only eight bridges had a sufficiency rating less than 50. Of those eight bridges, four are timber and four are concrete bridges. Sufficiency rating is a numeric value which is indicative of bridge sufficiency to remain in service as defined by the state and FHWA Bridge Inspection Safety Assurance Program.

TABLE 1
Numbers of Bridges by Material Type

Number	Main Span
6	Timber
10	Steel/Plate Girders
67	Concrete Slab/Box
52	PS Concrete Multiple Girders
28	Other PS Concrete
445	PS Concrete Box Girders
88	Culverts
696	Total 2009 Active Structures

TABLE 2
Age Distribution

Age (yrs)	Number
70	2
60-69	6
50-59	14
40-49	41
30-39	134
20-29	276
10-19	154
0-9	69
TOTAL	**696**

The four concrete bridges with a 2007 sufficiency rating less than 50 have provided collectively nearly 200 years of safe service to the county. One of the four has been replaced, one repaired, and two are due to be replaced.

Harris County is very pleased with the exceptional service life provided by its concrete bridges. The county has less than 1% of its concrete bridges with a sufficiency rating less than 50.

The cost of service often goes unreported. Harris County has seen growth that frequently requires changes in road alignment resulting in early bridge replacement. However, in many situations, existing bridges have been widened by extending the substructure, installing additional precast, prestressed concrete box girders, and installing a new deck wearing surface allowing the existing structure to continue to provide many years of additional service.

Concrete bridges continue to meet the Harris County's long-term needs and affordable life-cycle goals.

Jackie Freeman is deputy executive director of the Harris County Public Infrastructure Department and Willard Puffer is director of the Harris County Asset Management System, Houston, Tex.

EDITOR'S NOTE

If your county has a high percentage of concrete bridges or some interesting and innovative concrete bridges and would like to be featured in ASPIRE,™ please let us know at info@aspirebridge.org.