

has several deputies capable of performing safety checks and issuing citations related to motor carrier activities. However, there is only one deputy assigned to this activity on a full-time basis. The deputy, who is funded by the Road Fund, is equipped with a full-service van that includes portable scales, signs, and inspection tools which are all needed for investigating a suspicious truck.

Enforcing weight limit laws protects the bridge system from premature failure by keeping overloaded vehicles from making unauthorized crossings. In calendar year 2006, 171 citations were issued by the weighmaster.

Future Needs

The county's aging inventory of 78 structures with major timber components poses significant maintenance cost and continued susceptibility to isolated failure of individual parts.

According to the U.S. Census Bureau, the population was 499,794 in 2005 which represents a 12.2 percent increase in population since 2000. This is almost twice the rate of increase compared to the rest of the state, which was only 6.4 percent. According to Metro's forecast, Washington County's population will be approximately 650,000 by 2020.

All structures, but timber bridges in particular, will continue to deteriorate when exposed to increased traffic loads associated with this additional growth.

Table 5 identifies only seven timber structures scheduled for replacement as part of the OTIA III and MSTIP programs. The remaining 71 timber structures have an unfunded replacement cost estimated at \$53 million.

Table 5
Proposed Timber Structure Replacements

Road	Bridge #	Funding Source
229th Ave	1237	MSTIP
Cornelius Schefflin Rd	1304	OTIA
Greener Rd	1367	OTIA
Scholls Ferry Rd	1418	OTIA
Scholls Ferry Rd	1421	MSTIP
Spiesschaert Rd	1305	OTIA
River Rd	1422	MSTIP

Prioritization Model

All vehicular bridges in Washington County's bridge inventory are ranked using an empirical formula to identify a replacement priority matrix. The matrix generates a benefit/cost ratio and is based on the following equation:

$$\frac{\Sigma(\text{Deficiencies}) \times \Pi(\text{Importance Factors})}{\text{Cost}}$$

The benefit is defined as the "sum of the deficiencies multiplied by the product of the importance factors".

The deficiencies that are considered include:

- Type of construction material (more points if timber versus concrete or steel)
- Age of the structure (more points for aging timber)
- Width of the structure (planned width minus current width)
- Load Capacity (difference between existing capacity and highway legal capacity)
- Sufficiency Rating (difference between 100 and existing)

The importance factors take into consideration:

- Detour length
- Traffic volumes
- Functional classification
- Truck routes
- Emergency Transportation Routes

The cost assumes the bridge will be 20 feet longer with a width that meets the standards and guidelines established in the Transportation Plan based on the functional classification and ultimate number of lanes. The estimate is calculated by multiplying the ultimate deck area (i.e., length times width) by \$350 per square foot.

Bridge data is dynamic and, as it changes, so too will the ranking in the prioritization model. The prioritization model is a tool that is used only as a guideline for bridge replacement considerations. It is not intended to be a sole source reference for determining which projects should be constructed. Other influences that are considered with a bridge replacement project include corridor-related improvements, funding leverage, and regional transportation goals and objectives.

Forecast

Within 15 years, the average age of the county's remaining timber structures will be 57 years if no additional funds are expended for more bridge replacements (See **Figure 4**). Although routine maintenance and emergency repairs will allow many of these bridges to remain in service past their design life, it is likely that more will succumb to a level of deterioration that requires additional weight limits and / or closures.

Figure 4
Distribution of Structure Age (Timber)
At 2022 with No Additional Replacement Funding

