



# Bridge Performance Load Rating Bridge Weight Posting and Impacts on Freight Movement



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# Bridge Performance Section

Bridges are the Highest Risk Asset for TDOT

Bridge are HIGHLY REGULATED by FHWA

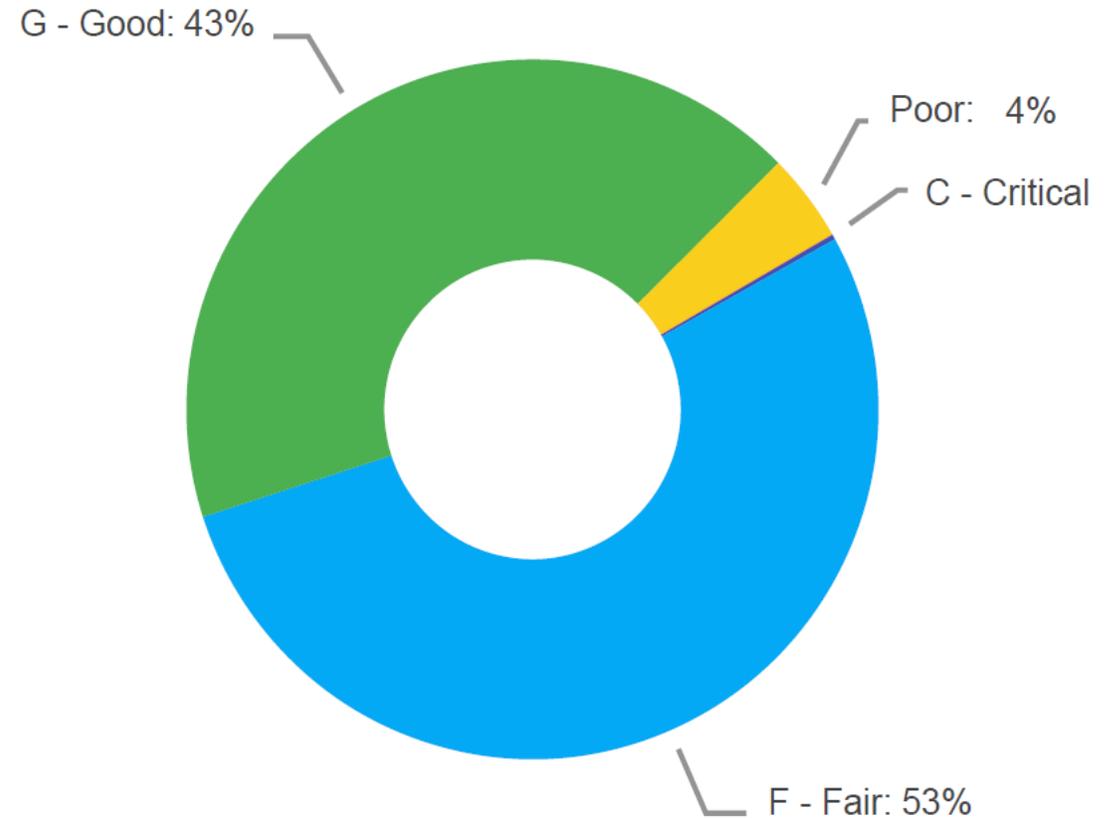
“You Can Drive on Failed Pavement...  
But You Can’t Drive on a Failed Bridge”



# Bridge Performance Section

## 20,034 Bridges

- Carrying Vehicular Public Traffic
- >20 Feet in Length
- Average Age ~ 50 Years

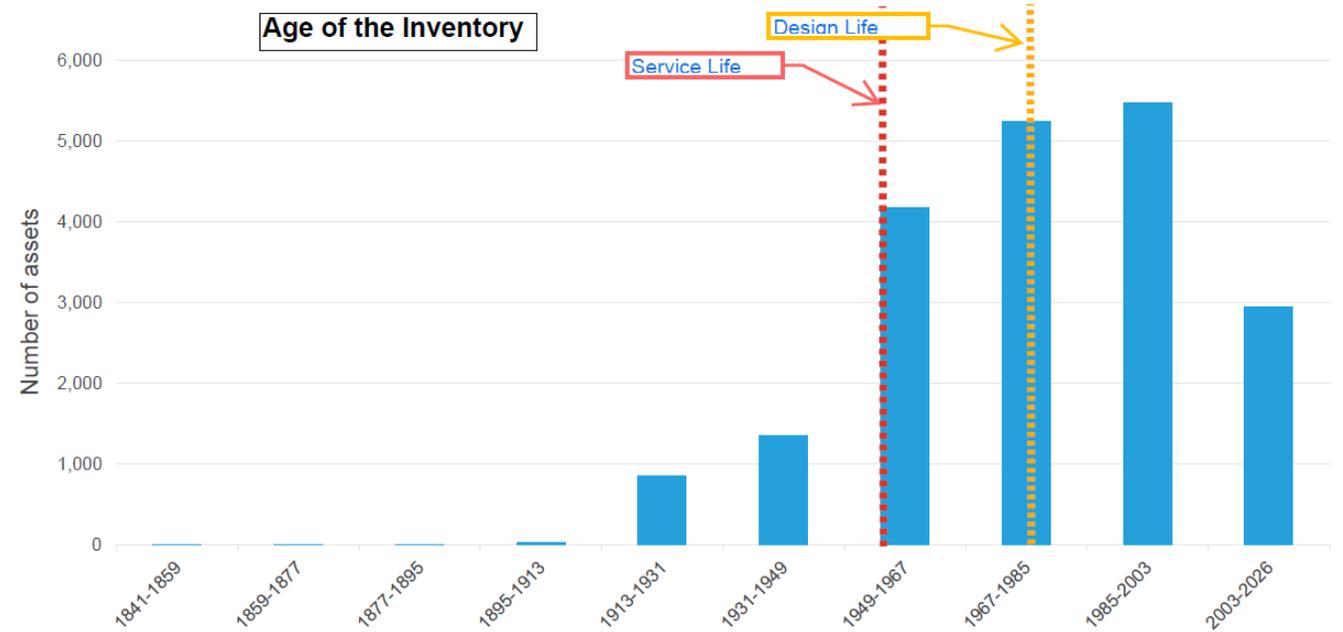


# Bridge Performance Section



**Old Stone Bridge**

Built in 1837



# Bridge Performance Section

TDOT inspects and evaluates all state AND local bridges

- Routine ~10,000
- NSTM ~80
- Underwater ~120
- Damage: ~100
- Cursory ~200
- Repair ~ 120
- Initials ~ 60



# Bridge Performance Section



# Bridge Performance Section

## Load Rating Triggers

- Condition Change
  - Deterioration
  - Damage
- Dead Load Change
  - Asphalt
  - Barriers
  - Sidewalks
- Code Changes
- Live Load Changes
  - ADTT Increase
  - **Exceptions in TN Laws**
  - Previously FHWA EVs



# Bridge Performance Section

## 10% Tolerance Impact

- Required Rating ALL BRIDGES
- Resulting in MORE POSTINGS
- Causing REROUTING FREIGHT
- Pulp Mill Operations Example



# Bridge Performance Section

## Key Exceptions in TN Law

- All Routes
  - Natural Gas Vehicles
  - Idle Vehicles
- Non-Interstate Routes
  - Federal Bridge Formula Does Not Apply
  - 10% Enforcement Tolerance

## Parametric Study Resulted in New Trucks

- 2 Sets – Interstate and Non-Interstate
- 28 Trucks in Each Set
- **6,667 Span Bridges require load rating**
- **9,164 Culverts require study/load rating**

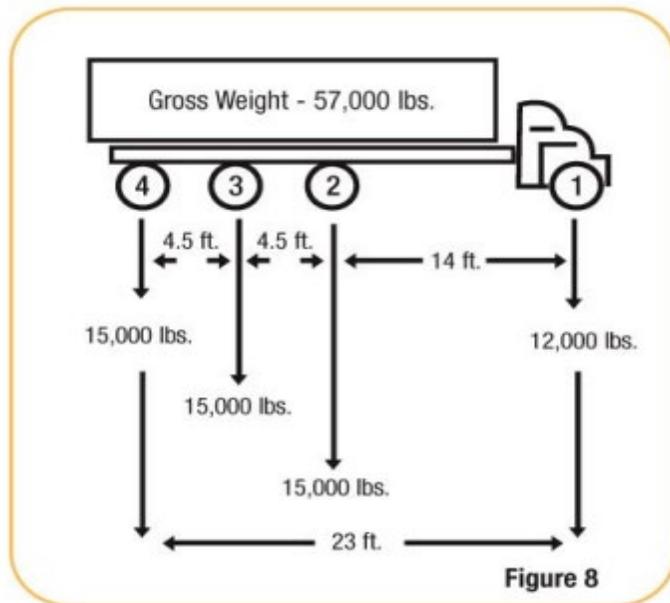


**Completed by December 2027**

# Bridge Performance Section

## Federal Law Limitations (23 U.S.C. 127)

- In addition to Bridge Formula weight limits:
- Federal law states that;
  - single axles are limited to 20,000 pounds
  - tandem axles are limited to 34,000 pounds
  - Gross vehicle weight is limited to 80,000 pounds
  - Dump Truck Gross Weight: 56,000 lb.



Permissible Gross Loads for Vehicles in Regular Operation <sup>1</sup>									
Based on weight formula $W = 500 \left[ \frac{LN}{N-1} + 12N + 36 \right]$									
Distance in feet (L) between the extremes of any group of 2 or more consecutive axles									
Maximum load in pounds carried on any group of 2 or more consecutive axles <sup>2</sup>									
L	N=	2 AXLES	3 AXLES	4 AXLES	5 AXLES	6 AXLES	7 AXLES	8 AXLES	9 AXLES
Tandem Axle Weight (see pages 3 & 4)	4	34,000							
	5	34,000							
	6	34,000							
	7	34,000							
	8	34,000	34,000						
	More than 8/less than 9	38,000	42,000						
	9	39,000	42,500						
	10	40,000	43,500						
	11		44,000						
	12		45,000	50,000					
	13		45,500	50,500					
	14		46,500	51,500					
	15		47,000	52,000					
	16		48,000*	52,500	58,000				
	17		48,500	53,500	58,500				
	18		49,500	54,000	59,000				
	19		50,000	54,500	60,000				
	20	Example (see page 7)	51,000	55,500	60,500	66,000			
	21		51,500	56,000	61,000	66,500			
	22		52,500	56,500	61,500	67,000			
	23		53,000	57,500	62,500	68,000			
	24		54,000	58,000	63,000	68,500	74,000		
	25		54,500	58,500	63,500	69,000	74,500		
	26		55,500	59,500	64,000	69,500	75,000		
	27		56,000	60,000	65,000	70,000	75,500		

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## TN Limitations

- DIMENSIONS:
  - Width: 8' 6"
  - Height: 13' 6"
  - Truck-Semi Trailer Length: 50'
- WEIGHTS:
  - Single Axle: 20,000 lb.
  - Tandem axle: 34,000 lb.
  - Max Gross Weight: 80,000 lb.
  - Dump Truck Gross Weight: 74,000 lb.



## Key Exceptions in TN Law

### **ALL ROUTES**

Natural Gas Vehicles

Idle Vehicles

Max Gross Weight: **82,000 lb.**

### **Non-Interstate Routes**

Federal Bridge Formula Does Not Apply

10% Enforcement Tolerance

Max Gross Weight: **88,000 lb.**

We have revised our Design Criteria to Add an Additional 10% to the Live Loads.

## Oversize & Overweight Permit Office

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# OS/OW Permit Office

### **TDOT OS/OW Permit Office**

James K Polk Building, Suite 800

505 Deaderick Street

Nashville, TN 37243

Phone: (615) 741-3821

Email: [TDOT.PermiOffice@tn.gov](mailto:TDOT.PermiOffice@tn.gov)



# Bridge Performance Section

Bridges are the **Highest Risk Asset** for TDOT

Bridge Postings are Increasing Due to:

- Aging Infrastructure
- Damage & Deterioration
- More Truck Traffic
- Heavier Loads
- Special Interest Changes to the Laws



Questions

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