

Target Range School Board
Target Range School
4095 South Avenue West
Missoula, MT 59804

September 13, 2012

Dear Board Members,

I know your first concern is the welfare and safety of Target Range School children on the school grounds as well as on their way to and from school. Thus I hope you are following the discussion and reports that are resulting from the Maclay Bridge Planning Study being conducted by the Montana Department of Transportation and Missoula County. There is a statement that should be of considerable concern to the School Board, as well as to the students' parents, in the Maclay Bridge Planning Study's Existing and Projected Conditions Report, p. 26:

Since the 2011 Bridge Inspection Report was prepared, there has been further analysis of the bridge that resulted in the posted load limit being reduced from 14 tons to 11 tons. This reduction was based on analysis by MDT engineers. The two primary vehicles impacted by this reduction are school buses and fire trucks. School buses are generally within the 11 ton limit, as they weigh approximately 19,000 pounds when empty and 22,000 pounds when loaded. Fully loaded school buses are near or at the 11 tons limit. School buses are thus allowed across the bridge, as long as they do not exceed the posted 15 mph speed limit. (emphasis added)

The fact that a loaded school bus is right at or perhaps at times over the posted load limit of the bridge is of major concern in and of itself. However, I have observed that very seldom does a slower moving vehicle like a school bus cross Maclay Bridge by itself. There is usually a string of cars following it and they all cross together. Thus the cumulative weight of a loaded school bus along with a following convoy of other vehicles would certainly far exceed the weight limit and would not provide any factor of safety.

Are you also aware the bridge has a number of structural risks and unknowns that state and county engineers have identified? These are listed in a May 12, 2011 Missoula County informational document, Maclay Bridge Project Frequently Asked Questions, and are included below:

1. What are the limitations of and/or problems with Maclay Bridge?

Maclay Bridge is considered functionally obsolete and fracture critical according to a

2011 Montana Department of Transportation Bridge Inventory. A fracture critical bridge contains a deteriorating design element that will cause the entire structure to fail. In this case, two trusses on the main span are the fracture critical design element. If one of the trusses should fail, the remaining truss cannot support the load or the shape of the entire structure and it would collapse. Modern bridge design incorporates redundancy in structural elements to avoid total bridge failure in the event of one element failing.

In addition to the design deficiencies, this bridge's piers are located in the river channel on unknown materials. The east approach to the original bridge was washed out by flooding in 1963, and since then the channel has been altered with the deposition of material upstream of the bridge. Changing the shape of the channel changes stream flow. Increased water velocities remove material from the stream bed. If too much material is washed away, the piers in the channel will become unstable.

Prior to the current studies, Missoula County and the Montana Department of Transportation contracted in 1992 for a site selection study for potential replacement of the old bridge. The 1992 study did not result in a decision, however, since funding was no longer available, although a completed and signed Environmental Assessment (EA) was published in April 1994. That EA identified a Preferred Alternative of constructing a two lane replacement bridge at the end of South Avenue. On page 9 of the EA, the following was stated about the existing bridge:

The existing Maclay Bridge is a one lane bridge built in 1935 and structurally modified once in the late 1940's, and again in 1964. Due to structural deficiencies and increased traffic, the bridge's present load limit is posted at ten tons (9,072 kg). This load limit, enforced by the County, does not allow 18,144 kg (20 ton) fire engines to use the bridge, and barely permits school buses to do so. Within the next ten years, continued deterioration of the structure is expected to reduce the allowable load limit to 4,536 kg (five tons), at which point it will be closed to vehicular traffic. Repairing the bridge to raise its allowable loading cannot be accomplished without removing and rebuilding the bridge super structure and replacing its substructure. Such improvement would constitute a total replacement of the bridge.

On page 17 of the 1994 Environmental Assessment, the following deficiencies were also noted:

The following factors contribute to the overall inadequacy of the structure:

- *Major Span. The floor beams and stringers are undersized and will only support a 9,072 kg (ten ton) load. In order to upgrade the capacity of these members, the entire superstructure for this span would need to be removed and replaced*
- *Pony Truss. A portion of the truss has been damaged by overweight loads.*

- *Foundations. The sandy soil below the existing river piers has been washed away. Rip rap has been placed to protect the piers; however, the foundations may still be susceptible to scour to depths below the footings.*
- *Approaches. Poor roadway alignments and lack of a guardrail at the bridge approaches create safety hazards for all types of traffic.*

The bridge will need to be reconstructed in order to correct these deficiencies. A new bridge will need to meet current floodplain regulations and design standards, neither of which is met by the existing one-lane bridge. (emphasis added)

Some limited temporary bridge repairs were conducted in 2003 to replace a few of the steel supports and the decking, but little was done to address the basic problems. Thus there remain documented problems and uncertainties with the foundation conditions under the old bridge; uncertainties about the bridge's stability during high water and its ability to survive a 100 year flood event; and the strength of the steel in the load bearing members. According to county records, the bridge is made up of a hodgepodge of pieces from far older bridges of uncertain age. It has been repaired (and washed out) a number of times in the past. It is currently in need of additional repairs and maintenance, as shown in the attached photos. However, Missoula County and Montana Department of Transportation do not plan to conduct a thorough analysis of the old bridge's existing issues as part of the current study, even though this study will soon result in conclusions and recommendations to the County Commissioners on whether to keep using the old bridge with minor repairs or to replace it with a modern safe bridge built to today's standards. For more information on the bridge's status and condition, visit www.Maclaybridge.com.

A collapse of that old bridge as a bus loaded with Target Range school children crossed it in high water, perhaps with a few vehicles behind it, is too horrible even to imagine. The School Board and parents of school children should demand more information and a thorough analysis by the County and State to assess these risks to our children and the community. With so many unknowns, common sense would dictate a close examination of the existing bridge to determine if the risks of keeping the old bridge are too great, whether repair is even a feasible option, and whether it is time to replace it.

Sincerely,



Don St. Peter

Target Range Resident



Spalled concrete and exposed rusted rebar in a Maclay Bridge support beam



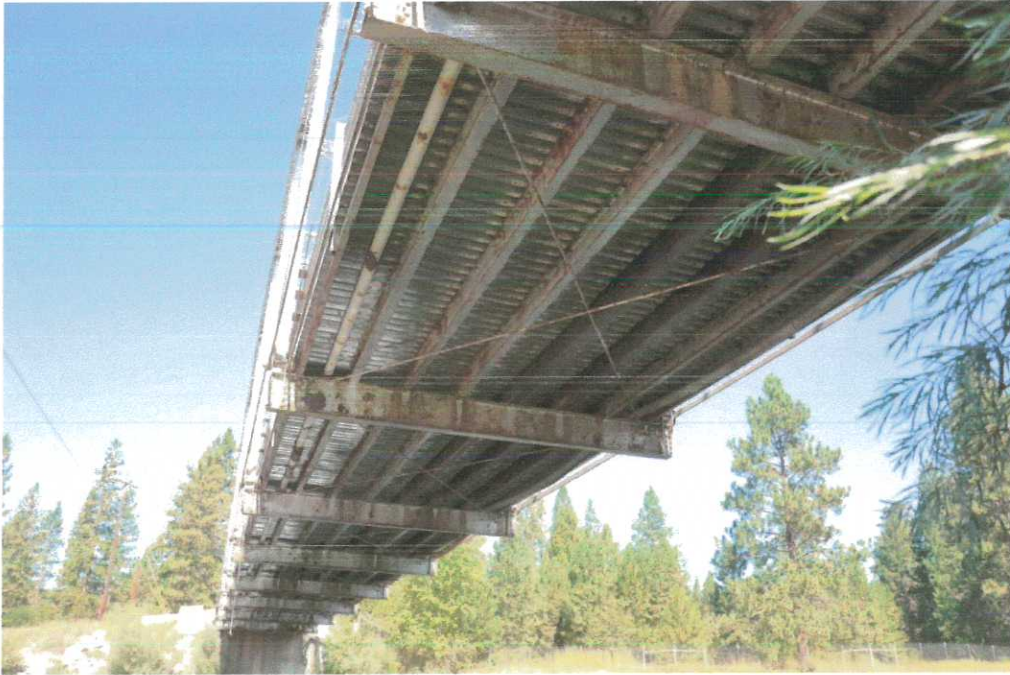
Broken & corroded concrete, exposed rusted rebar, and misaligned joint in bridge support beams



Rusted and pitted steel support beam under the bridge west span with corroded decking bolts



Cracked and corroded concrete in a main bridge support pier



Rusted and deteriorated west bridge span with various patches to the bridge support beams



Unshielded and exposed high pressure natural gas line on the bridge where it crosses a deteriorated support joint.