



# Maclay Bridge Options Evaluation

The matrix below summarizes several options for either leaving the existing Maclay Bridge in place, retrofitting the bridge, or removing it as part of the South Avenue Bridge Project.

| Option  | Option Description   | Advantages   | Disadvantages   | River Hydraulics and Floodplain Implications  | Long Term Financial Impact <sup>1</sup> | Initial Cost <sup>2</sup> |
|---|--|--|---|---|---|---------------------------|
| <b>Option 1:</b><br>Remove Bridge                             | Remove Maclay Bridge and restore the riverbanks.   | <ul style="list-style-type: none"> <li>Removes liability risks and maintenance responsibilities on the owner.</li> <li>No cost to the County.</li> <li>Lowest cost long-term solution.</li> <li>Best mitigates flood risk.</li> <li>Bridge abutment and pier removal and bank restoration reduces channel constriction and allows river to return to natural state.</li> <li>Public access to the river remains.</li> <li>Per resource agencies, removal of Maclay Bridge and river restoration mitigates, in part, for environmental impacts from the South Avenue Bridge.</li> </ul> | <ul style="list-style-type: none"> <li>Impacts historic resource.</li> </ul>  | <ul style="list-style-type: none"> <li>This option best improves the hydraulic opening. The 100-year flood elevation upstream of the Maclay Bridge is expected to drop more than 1-foot if the bridge is removed.</li> <li>Reduces flood risk to residences and infrastructure along the west bank. With removal of Maclay Bridge, water surface elevations will drop compared to leaving the bridge in place<sup>3</sup>.</li> <li>Eliminates issues with pier scour or increased scour and flooding from debris collecting on piers.</li> </ul>   | None                                    | \$350,000                 |
| <b>Option 2:</b><br>Do Nothing                                | Leave Maclay Bridge as-is, barricade to traffic and allow pedestrian access. Provide a parking area on either end of the bridge as allowable. <i>Note that the existing bridge low chord is below the predicted flood elevation (100-year) and the intermediate piers are vulnerable to scour.</i> | <ul style="list-style-type: none"> <li>Preserves historic resource.</li> <li>Minimal initial costs.</li> <li>Provides bike/pedestrian access.</li> <li>Public access to the river remains.</li> </ul>  | <ul style="list-style-type: none"> <li>Significant, ongoing maintenance costs and liability for the owner.</li> <li>Insurance policy to cover flood risk and other liabilities should be considered.</li> <li>Without traffic may attract more illegal use (climbing and jumping from bridge).</li> <li>Risk of scour and bridge washout.</li> <li>No mitigation of flood risk.</li> <li>Impacts hydraulics at proposed South Avenue Bridge.</li> <li>Leaves damaged steel members, expansion joints, and bearings in place.</li> <li>Some financial investment is needed to repair/strengthen the bridge and convert the structure to pedestrian use.</li> </ul> | <ul style="list-style-type: none"> <li>During the 10-year flood event, nearly twice the volume of water will overtop River Pines Road if the existing bridge is left in place, compared to removing the bridge.</li> <li>Extensive protective measures are required to fully mitigate scour and potential washout, and these measures may be cost prohibitive.</li> <li>The bridge low chord is below the 100-year flood elevation, which presents risk of structural damage and washout.</li> <li>The rise in base flood elevation due to both bridges would exceed state and county floodplain regulations.</li> </ul>  | High                                    | Minimal Initial Costs     |
| <b>Option 3:</b><br>Raise and Rehabilitate for Pedestrian Use | Raise bridge above the 100-year flood elevation, replace Pier 2, and rehab for pedestrian use with new concrete deck (or timber deck) and pedestrian rails. Repair or replace deficient steel members. Paint repair areas. Provide a parking area on either end of the bridge as allowable.        | <ul style="list-style-type: none"> <li>Preserves historic resource and extends life of bridge.</li> <li>Provides bike/pedestrian access.</li> <li>Public access to the river remains.</li> <li>Reduces risk of washout compared to Do Nothing option.</li> </ul>   | <ul style="list-style-type: none"> <li>High initial cost and requires maintenance and inspection costs for life of bridge.</li> <li>Without traffic may attract more illegal use (climbing and jumping from bridge).</li> <li>Piers are still misaligned with the direction of river flow and will be susceptible to scour and collecting debris. Only one pier is being replaced.</li> <li>Significant additional costs necessary to fully mitigate scour issue.</li> <li>Impacts hydraulics at proposed South Avenue Bridge.</li> </ul>   | <ul style="list-style-type: none"> <li>Despite the additional clearance provided by raising the existing bridge, negligible improvement in river hydraulics is predicted. Hydraulic and floodplain implications are essentially identical to Option 2.</li> <li>The additional clearance under the bridge reduces risk of structural damage to the superstructure during high flows.</li> <li>Extensive protective measures are required to fully mitigate scour and potential washout, and these measures may cost prohibitive.</li> <li>The rise in base flood elevation due to both bridges would exceed state and county floodplain regulations.</li> </ul> | Medium                                  | \$3,600,000               |



| Option  | Option Description  | Advantages  | Disadvantages   | River Hydraulics and Floodplain Implications  | Long Term Financial Impact <sup>1</sup> | Initial Cost <sup>2</sup> |
|---|---|---|---|---|---|---------------------------|
| <b>Option 4:</b><br>Multi-Stage Rehab<br>(Same work as Option 3 but spread out over multiple years of construction) | Stage 1: \$2,100,000. This stage raises bridge above the 100-year flood elevation, replaces Pier 2, and includes other minor repair items.<br>Stage 2: \$1,800,000. This stage replaces the existing deck and expansion joints, repairs steel members, installs new pedestrian rails, and other minor repairs. Provide a parking area on either end of the bridge as allowable. | <ul style="list-style-type: none"> <li>• Preserves historic resource and extends life of bridge.</li> <li>• Provides bike/pedestrian access.</li> <li>• Public access to the river remains.</li> <li>• Reduces risk of washout compared to Do Nothing option.</li> <li>• Allows for construction costs to be spread out.</li> </ul> | <ul style="list-style-type: none"> <li>• Increases overall construction costs due to multiple mobilizations.</li> <li>• Several deficient elements will not be repaired/replaced in the first phase.</li> <li>• High initial cost and requires maintenance and inspection costs for life of bridge.</li> <li>• Without traffic may attract more illegal use (climbing and jumping from bridge).</li> <li>• Piers are still misaligned with the direction of river flow and will be susceptible to scour and collecting debris.</li> <li>• Significant additional costs necessary to fully mitigate scour issue.</li> <li>• Impacts hydraulics at proposed South Avenue Bridge.</li> </ul> | <ul style="list-style-type: none"> <li>• The hydraulic implications of this option after the final stages of construction will be identical to Option 3.</li> </ul> | Medium                                  | \$3,900,000               |

Notes:

1. Qualitatively based on long-term financial implications such as on-going operations and maintenance, safety inspections, patrol requirements, etc.
2. Estimated costs are based on the present year (2021). The cost estimates include mobilization costs and a contingency.
3. River Pines Road is overtopped at approximately the 6-year event under existing conditions. Removal of Maclay Bridge lowers the water surface elevation such that River Pines Road is predicted to overtop at about the 7-year event.

A meeting was held on January 31, 2022, between the Missoula County Board of County Commissioners (BCC) and representatives from Fish, Wildlife & Parks (FWP), Missoula Conservation District, and the Clark Fork Coalition (CFC) to discuss the topic of removing Maclay Bridge in association with constructing the proposed South Avenue Bridge. The following includes a summary of potential mitigation opportunities that were identified during the meeting.

- CFC suggested mitigation strategy could look at a larger stretch of river upstream from county line to potentially purchase easements to ensure floodplains and riparian buffers are retained.
  - Open space bonds could be used.
  - Much of the areas are likely within floodplain and may not be readily developable as-is.
  - FWP suggested the Three Rivers Group would be a good organization to pursue a corridor-wide conservation approach.
- River restoration at Maclay Bridge (assuming removal) would involve removing riprap and grading back bank at existing abutment on west side to remove constriction.
  - Riprap removal upstream on the left bank would probably be limited due to needing to keep in place to protect River Pines Rd.
  - Consider options to provide a vegetated buffer where possible.
- FWP stressed the importance of O'Brien Creek and avoiding/minimizing impacts at the mouth.
  - Project should evaluate means to deter public access at the South Ave Bridge site to avoid excessive recreational/angling pressure at O'Brien Creek (e.g., fencing or vegetative/debris obstacles).
  - Site new bridge as far from O'Brien as possible. Restore/enhance riparian buffer.
- Per BCC, public access will be maintained at the Maclay Bridge site. Likely walk-in access and primarily on the east side of the river.
- Turnaround area for snowplows on the west side will need to be considered as part of the bridge removal and bank restoration design.