Project Update

EIS and ROD Documents through Current Design

Preliminary Design

- Completed preliminary design for full-build for all segments
- MDT has started ROW along Five Mile Road
- Prefinal design complete for Five Mile Road
- Yellowstone Segment PIH submittal end of July (about 70% design)

Johnson Lane Interchange

- Completed initial traffic operations analyses (Tier 1)
- Completed detailed traffic operations analyses (Tier 2)
- Working with MDT to define a design scope

The project is currently addressing preliminary design for each of the various segments.
CURRENT TIMELINE*

Billings Bypass Segments

- **2019**: Anticipated construction of Five Mile Road.
- **2020 - 2021**: Anticipated construction of Yellowstone Bridge segment. (At least 2 year project)
- **2021**: Anticipated construction of RR overpass segment. (Possible 2 year project)
- **2022**: Anticipated construction of Coulson Road segment.
- **2023**: Anticipated construction of Mary Street segment.
- **2024-2025**: Anticipated reconstruction of Johnson Lane Interchange

*Subject to available funding and right-of-way.*
JOHNSON INTERCHANGE
Billings Bypass
Interchange Selection Process

Tier I Workshop

- Conducted July 2017
- Based on 2040 volumes, all intersections reach LOS F under current diamond configuration
- 12 interchange concepts considered
- Based on safety, operations, right-of-way, and potential cost, 5 concepts advanced to Tier II.

- Alt 2A – DDI with Relocation of N. Frontage Road
- Alt 2B – DDI with Realignment of N. Frontage Road
- Alt 3B – Partial Cloverleaf with Direct Connection to N. Frontage Road
- Alt 5A – Single Point (SPUI) with Relocation of N. Frontage Road
- Alt 5B – SPUI with Realignment of N. Frontage Road
Interchange Selection Process

Tier II Workshop

- Conducted February 2018
- Reviewed refined, detailed operations and geometry of advanced alternatives
  - Network Operations (how all intersections interact)
  - Travel Time
  - Average Vehicle Delay and Queues
  - Ramp Operations / Interstate
- DDI and SPUI have similar operations (LOS C or better), while PARCLO could expect LOS D overall and a failing LOS for the EB ramp
- DDI safer than other alternatives
- DDI approximately $14M less expensive than SPUI

As a result of the tiered traffic and geometry analysis, a Diverging Diamond Interchange (DDI) was selected as the preferred alternative to advance to design.

A DDI configuration offered the best mix of operations, safety, and constructability.
Diverging Diamond Interchange

What is a Diverging Diamond?

Once implemented, the first DDI in Springfield MO resulted in a 60% reduction in collisions in a five month comparison of the old (diamond) interchange.
Diverging Diamond Interchange

Is this a new concept? No. The DDI configuration has been used for nearly 10 years in the US, the first being installed in Springfield MO.

Isn’t this a “big city” solution? Not necessarily. Pocatello ID, Rapid City SD, Cheyenne WY all have DDIs in operation, under construction, or currently in advanced design.
Diverging Diamond Interchange

Benefits to a DDI

**Safety.** Fewer conflict points, better sight distance, shorter pedestrian crossings, & improved traffic calming over traditional interchanges. Wrong-way entries extremely difficult.

**Operations.** Single phase traffic signals, shorter cycle lengths, “free” left and right turns, increased turn lane capacity, U-turns, and better coordination with adjacent signals. Operates well during power outages.

**Cost.** Reduced footprint due to the ability to use fewer lanes to move the same traffic. Less bridge structure due to fewer lanes. Reduced construction time.
### Safety

A DDI will reduce the number of conflict points (points of vehicle to vehicle contact) from 26 down to 14, and reduces the number of pedestrian conflicts from 10 to 8 (assuming full pedestrian movements).

<table>
<thead>
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<th>Type</th>
<th>Crossing</th>
<th>Merging</th>
<th>Diverging</th>
<th>Peds / Bikes</th>
<th>Total</th>
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<td>8</td>
<td>8</td>
<td>10</td>
<td>26 / 36</td>
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<tr>
<td>DDI</td>
<td>2</td>
<td>6</td>
<td>6</td>
<td>8</td>
<td>14 / 22</td>
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![DDI Diagram](image-url)
https://vimeo.com/143181922
Johnson Interchange DDI - Year 2040 AM Peak Hour (https://youtu.be/S6TsVfvH5DY)
YELLOWSTONE RIVER
Billings Bypass
Yellowstone River Bridge
Yellowstone River Hydraulics
CLOMR vs LOMR (www.fema.gov)

• CLOMR – Conditional Letter of Map Revision
  • Initial approval process through FEMA
  • Required if a project will affect river elevation and floodway
  • Required before construction

• LOMR – Letter of Map Revision
  • Once project complete, LOMR is the actual revision to FIRM maps
  • As-Built certification of constructed improvements
  • Occurs after construction

• Both CLOMR and LOMR will be completed for Bypass relative to Yellowstone River
Yellowstone River Bridge – Profile

[Diagram of Yellowstone River Bridge profile with various annotations and measurements.]

DOWL

MONTANA DEPARTMENT OF TRANSPORTATION
Yellowstone River Bridge – Typical Section
Yellowstone River Bridge - Trail

Overbank Protection

Stormwater Outfall

Gravel Pit

RCB Pass-Thru Culverts

TEDD Trail TBD