

# The Problem: Frequent Flooding Due to Restrictive Channel Openings

The Oslo area has a significant transportation dilemma on its hands that has been causing headaches for years. The Oslo Bridge, which is the primary link between Minnesota and North Dakota over the Red River in this region, is nearing the end of its useful life and must be replaced.

The 55-year-old fracture critical structure has many deficiencies and falls short on several transportation standards and requirements, which threatens public safety.

Year after year the Red River floods in the spring, which temporarily shuts down the Oslo, Marais, Highway 317, and Northern Plains Railroad Bridges. Many hours are wasted for area residents, agricultural production suffers, additional fuel costs are realized, and railroad service is disrupted.

In addition to the Oslo Bridge, the Border Township Associative Group's (BTAG) comprehensive transportation solution for the entire Oslo area will address the Marais Bridge and the Northern Plains Railroad Bridges adjacent to Highway 1/ND 54 over the Red River and North Marais River as well as the Highway 317 Bridge. All of these structures and approach roadways need modification or replacement in order to provide efficient and safe transportation for the Oslo area.

## Oslo Area Economic Losses

- » Average loss/flood event: \$25.6 million
- » Land value losses: \$320 million
- » FEMA money spent: \$1.35 million/flood
- » \$250K Railroad damage and 5–8 weeks of lost service time per flood event



## Transportation Issues

- » The Oslo, Marais, and Northern Pacific Railroad Bridges lose service during common Red River flooding.
- » Lengthy detours result from frequent flooding.
- » Hazardous conditions for transporting farm machinery.

## Bridge Deficiencies and Restrictions

- » The Oslo and Highway 317 Bridges are fracture critical structures. Potential for collapse with loss of one tension member.
- » Load capacities do not meet current standards.
- » Lead-based paint system on the Oslo Bridge.
- » History of damage to structural members from vehicles.
- » The Oslo and Highway 317 Bridges have limited remaining useful life.
- » Horizontal and vertical clearances are substandard.
- » No pedestrian accommodations are available on the Oslo and Highway 317 Bridges.
- » The Northern Plains Railroad Bridge adjacent to the Oslo Bridge is 109 years old.
- » Massive center of channel pier on Railroad Bridge is restrictive and susceptible to scour and debris accumulation.
- » Embankment and soil movement issues.

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## Proposed Comprehensive Solutions

- » Provide bridge openings proportional to up and downstream locations compliant with FEMA requirements.
- » Site new bridges/roads/railroad grades with residual clearance above flood elevations.
- » Construct contemporary cost-effective bridge replacement designs to minimize long-term maintenance costs, provide structural integrity, and accommodate future conditions.
- » Coordinate solutions to enhance service levels on I-29 and TH1 east of Oslo.
- » Promote strategic distributed storage projects throughout the Red River Basin for mainstem flow reduction.
- » Capitalize on the unprecedented spirit of cooperation between local, county, state, and federal entities.
- » Promote growth/economic prosperity for the region.
- » Assist in leveraging funding sources.

## WE NEED EVERYONE'S SUPPORT



Border Township Associative Group

*"We're really excited about this project! The need is definitely there—we've been battling flooding issues with these bridges for a long time." — BTAG*

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The Border Township Associative Group (BTAG) was formed in early 2013 and consists of area townships in Minnesota and North Dakota and the City of Oslo, MN. This group is on a mission to bring an end to one of the biggest headaches the Oslo area has faced for many years—unsafe bridges that are prone to flooding year after year, which jeopardize safety and result in significant economic losses to the region.

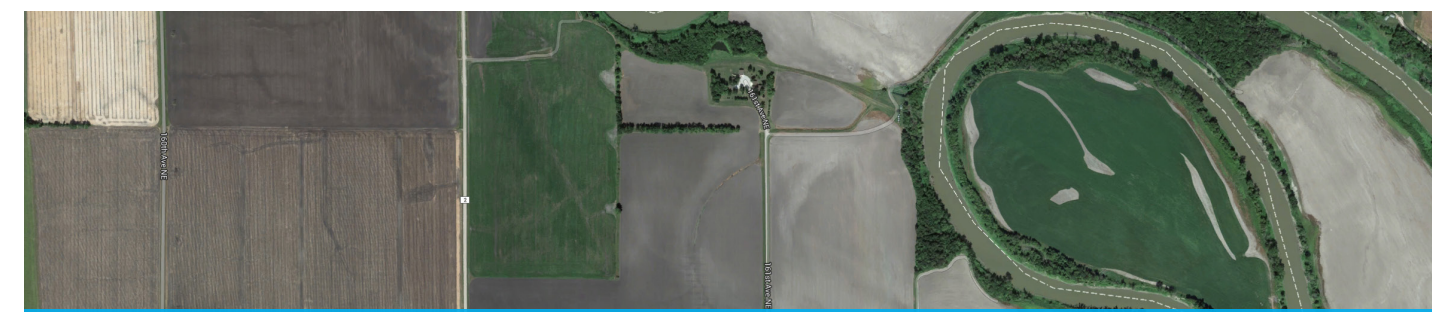
### BTAG Representatives

- » Big Woods, MN — Joel Osowski
- » Fork, MN — Cary Osowski
- » Higdem, MN — James Bergman
- » Oak Park, MN — John Nelson
- » Pulaski, ND — Gary Babinski
- » Turtle River, ND — Derek Gowan
- » Walshville, ND — Craig Jones
- » City of Oslo, MN — Tom Kallock

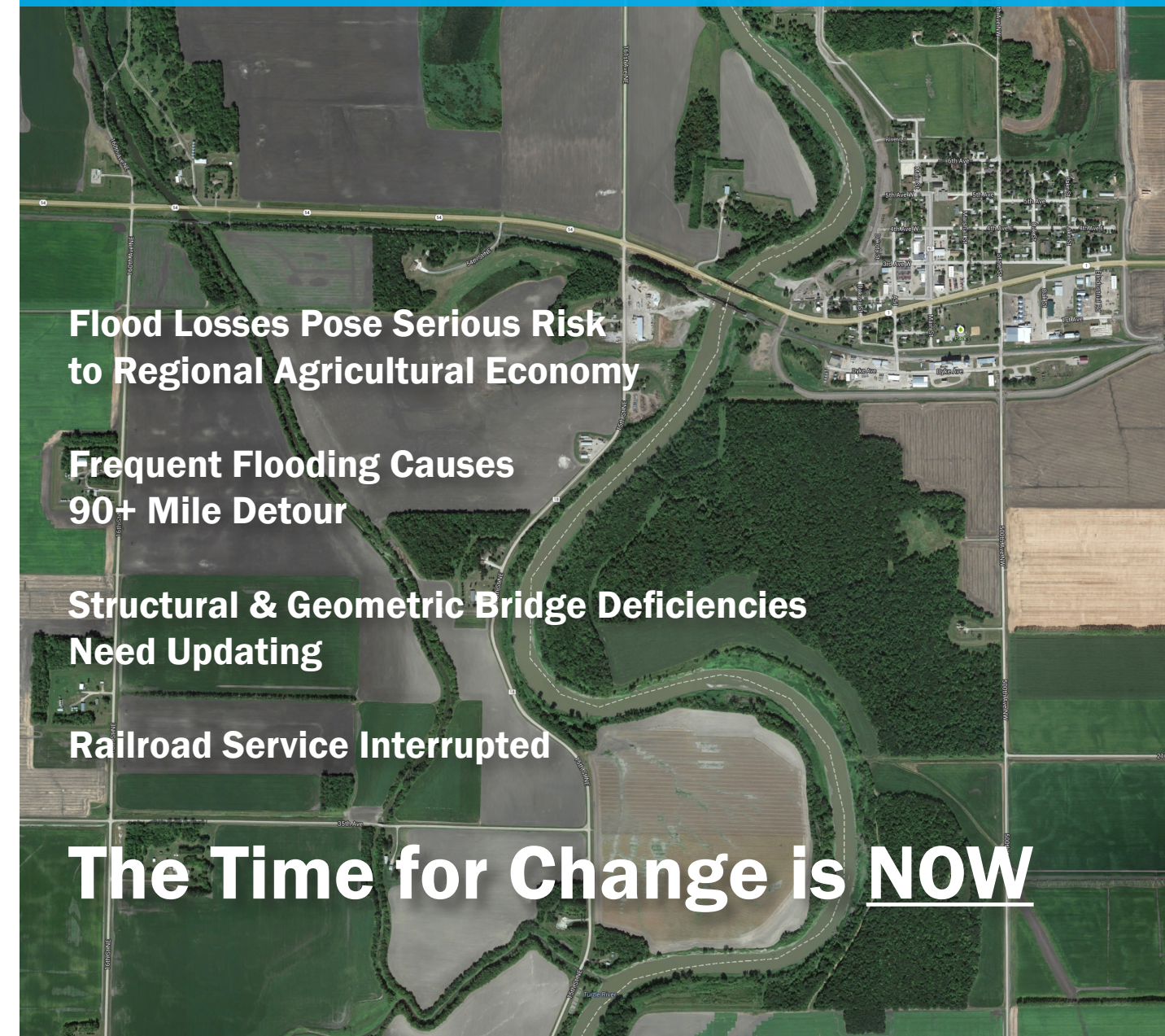
### Border Township Associative Group (BTAG) Goals

- » Provide transportation service levels consistent with up and downstream Red River crossing locations.
- » Contain flows as close to the main channel center line as possible.
- » Serve as local experts on water decisions.
- » Work cooperatively with other entities to facilitate local water management.
- » Promote inter-state cooperation on cost-effective transportation improvements.

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# Oslo Area Comprehensive Transportation Solution



Flood Losses Pose Serious Risk  
to Regional Agricultural Economy

Frequent Flooding Causes  
90+ Mile Detour

Structural & Geometric Bridge Deficiencies  
Need Updating

Railroad Service Interrupted

The Time for Change is **NOW**

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# The Solution: New Construction and Adjusted Road Elevations for the Oslo, Marais, Highway 317, and Northern Plains Railroad Bridges

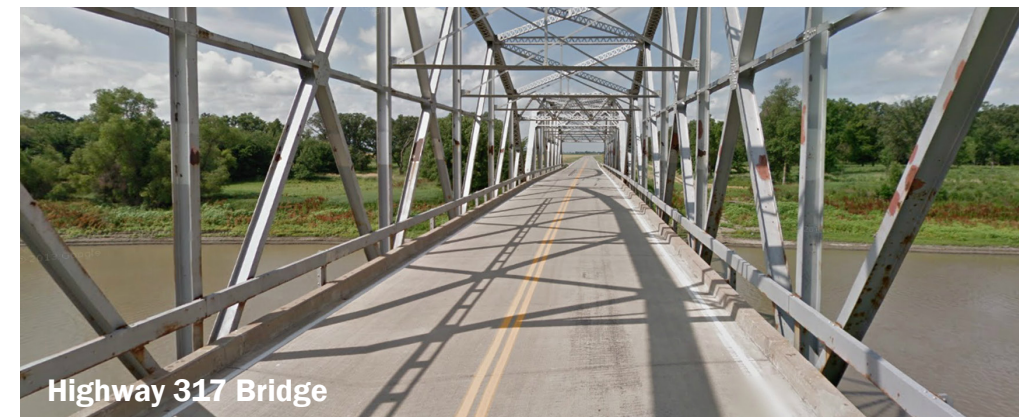
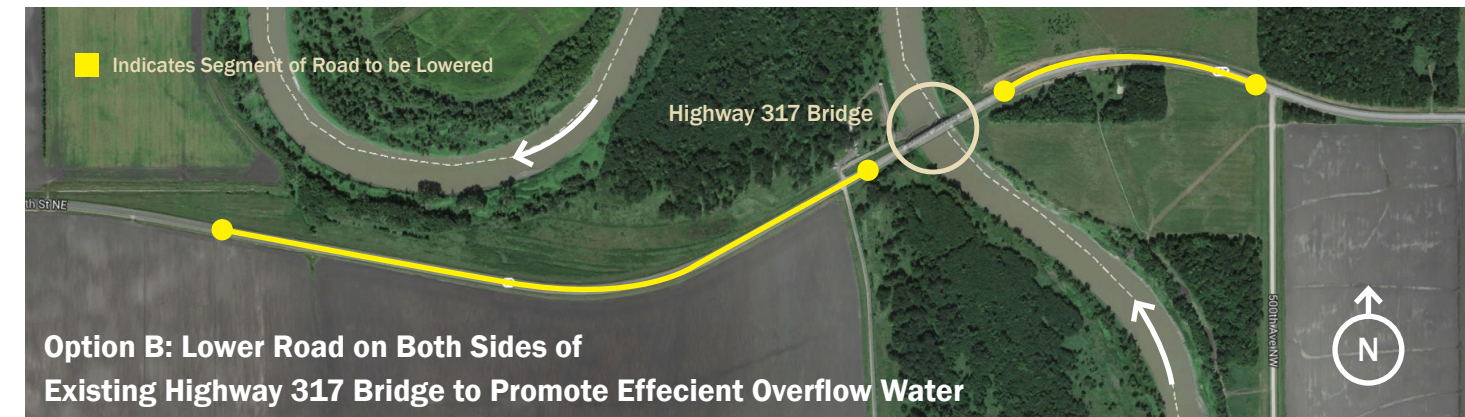
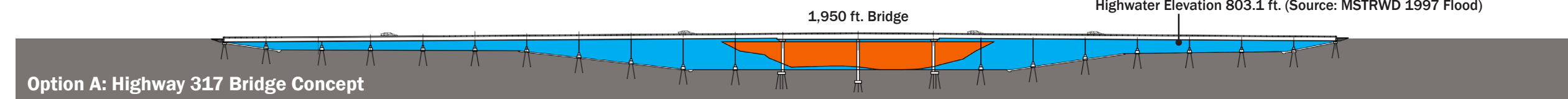
## Highway 317 Bridge

The Highway 317 Bridge is frequently out of service during elevated water levels. It's the oldest of the highway bridges in this group and has numerous structural problems. The restrictive opening compounds flooding and dechannelizes the river. Option A or B will solve this problem. This improvement, along with the Oslo and Marais Bridges will ensure safe, efficient transportation routes for this region well into the future. **Option A** would provide a new bridge structure and larger

channel opening consistent with up and downstream bridges, resulting in more efficient flood flows through the crossing and reducing flooding.

**Option B** would provide for efficient flood flows through this crossing using the existing bridge and modified roadway elevations. Flow will pass over the road and through the bridge simultaneously, reducing the dechannelization of the water.

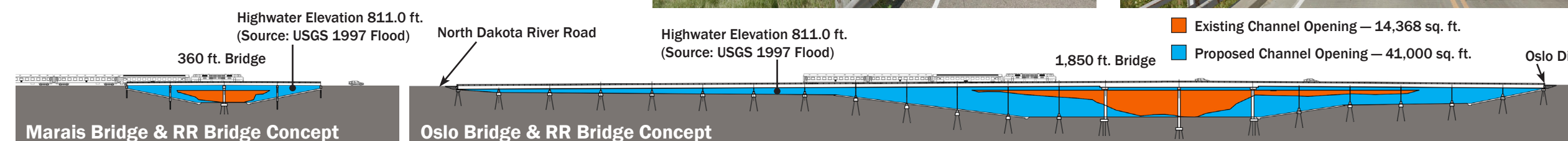
Existing Channel Opening — 16,318 sq. ft.  
Proposed Channel Opening — 51,600 sq. ft.



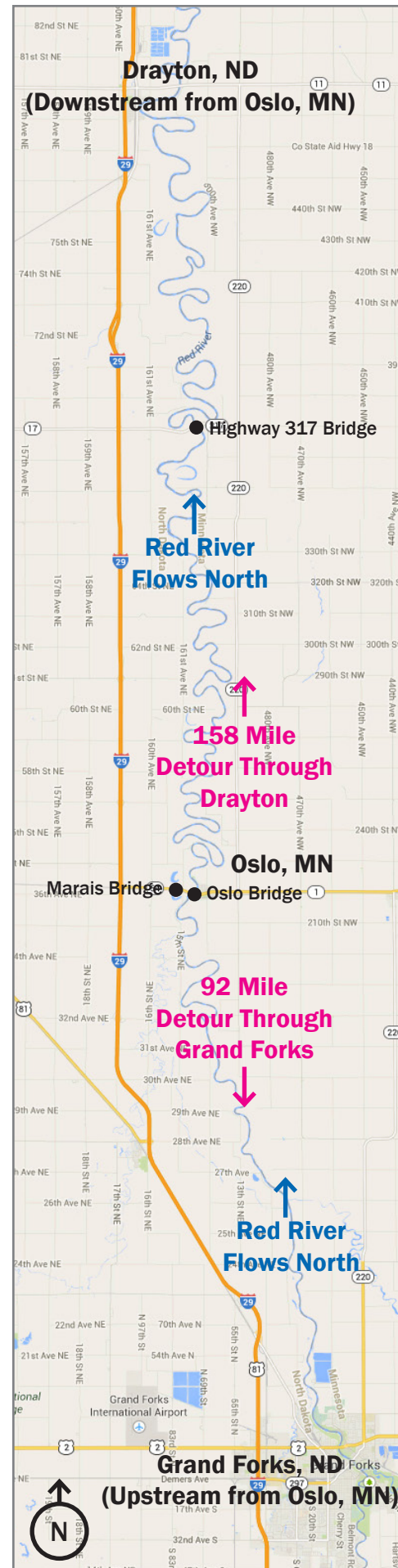
## Oslo, Northern Plains Railroad, and Marais Bridges

As part of the comprehensive transportation solution we propose the Oslo, Northern Plains Railroad, and Marais Bridges be replaced concurrently. The Marais Bridge sits a little over one mile west of Oslo and is prone to flooding. If one crossing is open and one is out of service, the route is still unusable. Reconstructing both crossings will ensure this vital link remains open at all times. The Oslo and Northern Plains Railroad Bridges have geometric and structural deficiencies which threaten public safety. We propose constructing new bridges and channel openings and adjusting elevations to ensure these routes remain open even during future flood events.

Existing Channel Opening — 2,940 sq. ft.  
Proposed Channel Opening — 6,000 sq. ft.



Existing Channel Opening — 14,368 sq. ft.  
Proposed Channel Opening — 41,000 sq. ft.



Bridge Name	Approx. Distance Up/Downstream from Oslo Bridge	Drainage Area (sq. mi.)	Existing Waterway Opening (sq. ft.)	Proposed Waterway Opening (sq. ft.)
Drayton Bridge (TH 11)	26 Miles Downstream (North)	34,800	57,623	—
Highway 317 Bridge (ND 7)	14 Miles Downstream (North)	32,290	16,318	51,600
Marais & Oslo Bridges (ND 54/TH 1)	—	31,200	17,308	47,000
Kennedy Bridge Complex (US 2)	19 Miles Upstream (South)	30,100	30,970	—
Thompson Bridge (CR 9)	31 Miles Upstream (South)	24,010	34,239	—

Like all rivers, the width and depth of the Red River changes as it flows down the border of Minnesota and North Dakota. As water levels increase, bottlenecks begin to occur in portions of the river that have smaller waterway openings. This causes flooding to occur. One of the reasons the Oslo and Highway

317 Bridges are so prone to flooding is because their waterway areas are restrictive. The excess water needs to go somewhere, and therefore rises out of the river channel and floods adjacent roads and fields. The table above and chart below compare waterway openings of up and downstream bridges.

## Existing Waterway Opening Comparison

