100 WEST BRIDGE

600 S 100 W LOGAN, UTAH

TRAILHEAD ENGINEERING

COLLEGE of ENGINEERING
UtahStateUniversity

Figure 1. Trailhead Engineering Team: Jordan Foraker, Annie Thacker, Kate Christiansen, Kyle Alger, Braxton Cook

PROPOSAL SUMMARY

Trailhead Engineering has designed a bridge to connect 100 W over the Logan River. The purpose of this project is to:

- **Reduce travel times** by making 100 W an alternative route to Main Street
- **Improve safety** by reducing congestion on Main Street
- **Improve recreation** by extending the current pedestrian trail
- **Accommodate** Cache Valley's growing population

ALTERNATIVES

Alignment Alternatives
- East of church
- West of church
- Through church

Structural Alternatives
- Steel bridge
- Concrete bridge
- Box culvert

CRITERIA AND DECISION MATRICES

Table 1. Alignment Decision Matrix

Criteria	Weight	East Roadway	Weight	Through Church	Weight	No Build	Weight
Travel Time	0.3	9	2.7	10	3	2	0.6
Overall Cost	0.1	7	0.7	2	0.2	10	1
Environmental	0.15	5	0.75	5	0.75	5	0.75
Public Impact	0.2	8	1.6	3	0.6	5	1
Geometric Design	0.25	7	1.75	5	1.25	5	1.25
Total:		Total =	**7.5**	Total =	**5.8**	Total =	**4.6**

Table 2. Structural Decision Matrix

Criteria	Weight	Steel Bridge	Weight	Box Culvert	Weight	Concrete Bridge	Weight	No Build	Weight
Overall Cost	0.2	4	0.8	3	0.6	5	1	10	2
Aesthetics	0.35	2	0.7	4	1.4	6	2.1	3	1.05
Environmental	0.25	6	1.5	5	1.25	5	1.25	10	2.5
Durability	0.2	8	1.6	7	1.4	8	1.6	1	0.2
Total:		Total =	**4.6**	Total =	**4.65**	Total =	**5.95**	Total =	**5.75**

Note: Higher values produce favorable alternatives in the decision matrix

SELECTED ALTERNATIVES

Based on the decision matrices and client needs, Trailhead Engineering decided on:

- **East alignment** to avoid disruption of the church property
- **Concrete Bridge** for aesthetics and durability

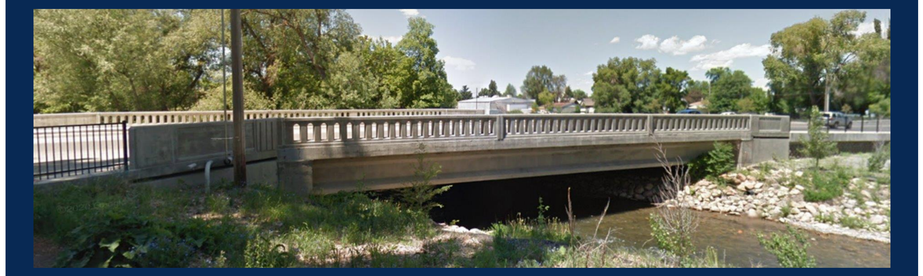


Figure 2. Similar bridge over the Logan River on 100 East

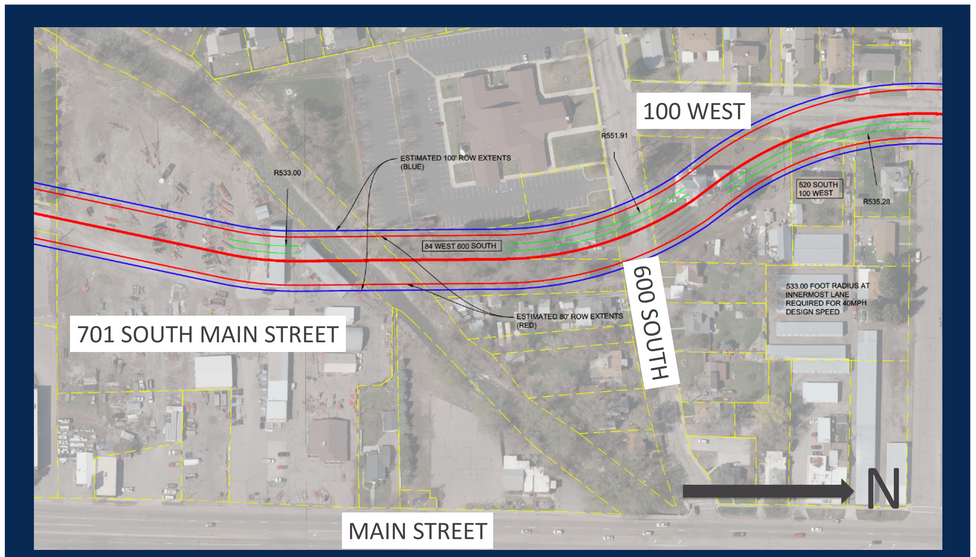
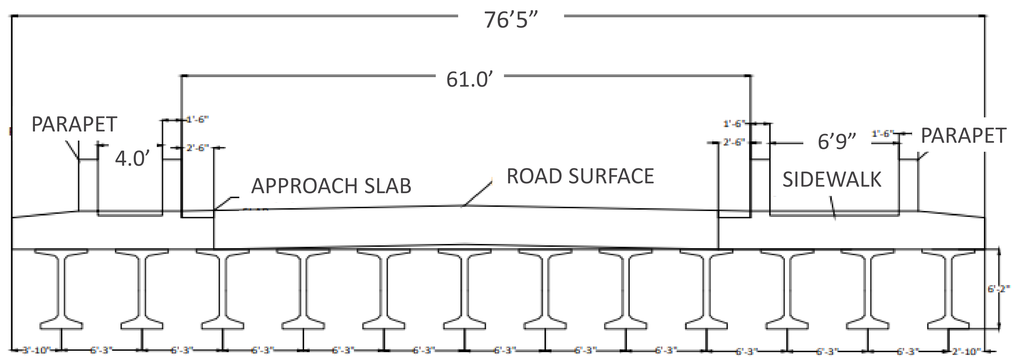


Figure 3. Aerial map view of the chosen alignment

DESIGN

- 135' long x 76'-5" wide
- 8" thick deck
- 4 travel lanes with a median lane
- Pedestrian sidewalks



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Logan City

LOGAN CITY UNITED IN SERVICE

UtahStateUniversity