The purpose of this project was to improve the current road conditions found at 900 South, from 900 East to 1300 East in Salt Lake City, Utah. Salt Lake City’s three main goals for this project included:

- Improvement of the current road structure
- Redesign of the five-way intersection
- Addition of a separate bicycle path

The current road surface requires repair due to extreme fatigue cracking, which is caused in part by railroad tracks under the pavement along some sections. These tracks need to be removed and the pavement replaced.

The current five-way intersection causes safety concerns and confusion to drivers. FGE redesigned the five-way intersection at 900 South and 1100 East to promote safety and ease of use.

The addition of a separate bicycle path connects to the existing 9-Line bicycle path in SLC. This path improves accessibility and safety for non-motorized forms of transportation. Such an effort promotes a greener and more sustainable community environment.

FGE examined 6 alternative designs for the intersection of 1100 East, 900 South, and Gilmer Drive.

(1) Five-Way Stop (No-Build)  (2) Traffic Signal

(3) Roundabout  (4) Merge Gilmer Drive with 1100 East

(5) End Gilmer Drive with a cul-de-sac  (6) Merge Gilmer Drive with 900 South

A pre-screening process eliminated the following alternatives for the reasons listed:

- Merge Gilmer Drive with 1100 East or 900 South
  - Inadequate spacing between intersections, significant right-of-way acquisition required, and construction cost of meeting grades
- End Gilmer Drive with a cul-de-sac
  - Exceeds SLC’s maximum cul-de-sac length of 400 feet, negative stakeholder input, and significant right-of-way acquisition required

A Pugh matrix was used to evaluate the remaining three alternatives. This matrix included six criteria:

- Traffic flow
- Safety
- Stakeholder preference
- Business access (to the coffee shop)
- Constructability
- Overall cost.

The criteria were rated on a 1 to 4 scale with 4 being the best. Traffic flow was determined to be the most important criterion and thus assigned a 2.5 multiplier.

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Traffic Flow x 2.5</th>
<th>Safety</th>
<th>Stakeholder Preference</th>
<th>Business Access</th>
<th>Constructability</th>
<th>Cost</th>
<th>Total Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Five-Way Stop (No-Build)</td>
<td>2.5 (1)</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>15.5</td>
</tr>
<tr>
<td>Roundabout</td>
<td>10 (4)</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>25</td>
</tr>
<tr>
<td>Traffic Signal</td>
<td>7.5 (3)</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>18.5</td>
</tr>
</tbody>
</table>

The Pugh matrix is shown below.

The proposed design includes a roundabout, a bike path, and improved drive approaches. Estimated construction cost: $2,490,358.

Team/Special Thanks

FGE Team Members: Kam Eslinger, Josh Fallon, Tom Hill, Jackson Sagers, Seth Thompson

FGE would like to thank the following individuals:

- Josh Thompson, Eric Casperson, and John Coyle with Salt Lake City Engineering
- Patrick Singleton and Austin Ball with Utah State University

Design aspects included the roundabout, bike path placement, drive approaches, storm water, utilities, curb and gutter, safety analysis, construction staging, bus and traffic detours, and road cross section.

See roadway design plan view below.