Intersection Analysis at 1st Avenue S and Armstrong Blvd S & 7th St S, St. James, Minnesota
Why alternatives

• Opportunity while the road is completely replaced
• Review options for optimizing traffic flow through the intersections
• Providing St. James with a sustainable and safe Highway
Today’s Conditions
## Vehicle Classification

### FHWA Vehicle Classifications

1. **Motorcycles**
   - 2 axles, 2 or 3 tires
   - ![Motorcycle]

2. **Passenger Cars**
   - 2 axles, can have 1- or 2-axle trailers
   - ![Passenger Cars]

3. **Pickups, Panels, Vans**
   - 2 axles, 4-tire single units
   - Can have 1 or 2 axle trailers
   - ![Pickups, Panels, Vans]

4. **Buses**
   - 2 or 3 axles, full length
   - ![Buses]

5. **Single Unit 2-Axle Trucks**
   - 2 axles, 6 tires (dual rear tires), single-unit
   - ![Single Unit 2-Axle Trucks]

6. **Single Unit 3-Axle Trucks**
   - 3 axles, single unit
   - ![Single Unit 3-Axle Trucks]

7. **Single Unit 4 or More-Axle Trucks**
   - 4 or more axles, single unit
   - ![Single Unit 4 or More-Axle Trucks]

8. **Single Trailer 3- or 4-Axle Trucks**
   - 3 or 4 axles, single trailer
   - ![Single Trailer 3- or 4-Axle Trucks]

9. **Single Trailer 5-Axle Trucks**
   - 5 axles, single trailer
   - ![Single Trailer 5-Axle Trucks]

10. **Single Trailer 6 or More-Axle Trucks**
    - 6 or more axles, single trailer
    - ![Single Trailer 6 or More-Axle Trucks]

11. **Multi-Trailer 5 or Less-Axle Trucks**
    - 5 or less axles, multiple trailers
    - ![Multi-Trailer 5 or Less-Axle Trucks]

12. **Multi-Trailer 6-Axle Trucks**
    - 6 axles, multiple trailers
    - ![Multi-Trailer 6-Axle Trucks]

13. **Multi-Trailer 7 or More-Axle Trucks**
    - 7 or more axles, multiple trailers
    - ![Multi-Trailer 7 or More-Axle Trucks]
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<tr>
<th>Vehicle Type</th>
<th>AM (8:00-9:00 AM)</th>
<th>Mid-day (12:00-1:00 PM)</th>
<th>PM (4:00-5:00 PM)</th>
<th>Daily</th>
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<td>1.9%</td>
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<td><strong>100%</strong></td>
<td><strong>100%</strong></td>
<td><strong>100%</strong></td>
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Option 1 - Signals

- 40 Existing parking stalls
- 19 Loss parking stalls
- 21 Remaining parking stalls
Option 2 – Mini-roundabout w/ parallel parking

40 Existing parking stalls
22 Loss parking stalls
2 New parking stalls
20 Remaining parking stalls
Option 3 – Mini-roundabout w/ diagonal parking
**Existing PM Peak Hourly Volumes**

**Existing PM Peak Hourly Volume**
4:00 – 5:00 PM

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<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
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<tr>
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![Diagram of traffic volumes](image-url)
Forecasted PM Peak Hourly Volume

Forecasted PM Peak Hourly Volume
4:00 – 5:00 PM

Growth Rate = 22%

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<th>D</th>
<th>E</th>
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Operational Performances *(Existing PM Peak Period)*

### Signalized Intersections *(80-sec signal cycle)*

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<th>Approach</th>
<th>Queue Length (ft)</th>
<th># Stops</th>
<th>Throughput (veh/hr)</th>
<th>Average Stop per vehicle</th>
<th>Approach Delay (sec)</th>
<th>Approach LOS</th>
<th>Intersection Delay (sec)</th>
<th>Intersection LOS</th>
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### Mini-Roundabouts

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<th>Throughput (veh/hr)</th>
<th>Average Stop per vehicle</th>
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<th>Approach LOS</th>
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<th>Intersection LOS</th>
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## Operational Performances (Forecasted PM Peak Period)

### Signalized Intersections (80-sec signal cycle)

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<th>Throughput (veh/hr)</th>
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### Mini-Roundabouts

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Demonstration at GM Runge

Mini-roundabout demonstration in St. James - Photos by Robert Jones

Bus Demonstration
Semi Demonstration
# Construction Costs

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<th>County</th>
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<td>$10,000-$20,000</td>
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