Park Avenue SH 9 Modeling and Feasibility Study

Town of Breckenridge
Project Team Presenters

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Capital Projects Manager

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PTOE

Mark Johnson, P.E.

Kamesh Vedula P.E. T.E.
Today’s Outline

• Introduction/ Existing Conditions
• Project Overview
• Analysis Methodology
• Findings, Recommendations
Breckenridge

- **Population:** 4,700 residents
- **Annual Skier Visits:** 1,600,750 (2\textsuperscript{nd} Highest in Country)
- **Visitors:** 3,000,000+ per year
- **National Register of Historic Places:** 200 structures
- **Restaurants & Bars:** 76
- **Shops & Boutiques:** 203
- **Hotel Beds:** 800
- **Condo Beds:** 5,000

(Source: Breckenridge.com)
Existing Conditions and Issues
Existing Conditions and Issues

• Large volume of pedestrians crossing Park Avenue during peak skiing.
Existing Conditions and Issues

• 4pm Exodus
Existing Conditions and Issues

- Busses “blocking” for each other
- Transit Staff directing traffic
Current Attempts at Traffic Congestion Relief

- Priced Parking on Main Street
- Modified Parking Operations
Planning Task

- Park Avenue is an existing two-lane roadway and traditional
- Widening was determined to be cost prohibitive through many sections of the corridor.
Planning Task

- 5 signalized intersections
- 2 roundabouts
- 3 stop-controlled intersections
- Multi-Modal Corridor solution to improve safety and operations for all modes and transit circulation along the corridor without widening the roadway.
Design Yr. Traffic Volumes
Design Traffic Volume

- Analysis based upon 30th busiest day
- Equates to a “Busy weekend day in February”
- Set realistic expectations for Town

30th Day
24,900 VPD
Analysis Methodology
Analysis Methods

- 4 Primary modeling/Phasing scenarios

- Each Scenario builds upon one another in a logical manner
Analysis Methods

• Includes both deterministic and micro-simulation
  • Signals vs Roundabouts

• Calibrated using existing conditions

• Design Year Forecast
Roundabout Analysis and Design

- Key Issues for Roundabout Design/Modeling:
  - Single and multi-Lane Roundabouts with Varying Geometrics
  - Maintain two lane roadway w/Flared Entries Key to avoid roadway widening
FRENCH SHORT FLARED TWO-LANE ENTRY (NB & SB)

SKI HILL W/ YIELD RT LANES (NB AND SB ENTRIES)

WATSON WITH FLARED TWO-LANE ENTRIES

AIRPORT FLARED TWO-LANE ENTRIES
Key Issues to Solve For at Main St and Village Rd

- Resolve Mid Block Ped Crossing
- Determine intersection type

- 800-1200 pedestrians/hour during current peaks
Micro Simulations
Micro Simulations
Micro Simulations
Project Prioritization #1:
Roundabouts at S. Main Street and Village Road

- Access Control to RI/RO, per CDOT
- Pedestrian Crossing
  - Controlled Area
- Consider Pedestrian Grade Separation
  - May not capture all peds/peaks
Roundabout Corridor is the Best CSS

- Phased Roundabouts meet Town Objectives:
  - Multi-Modal Corridor solution
  - Improve safety and operations for all modes
  - Transit circulation along the corridor
- Without widening the roadway.
Thank you!
## Summary of Preliminary Costs

<table>
<thead>
<tr>
<th>Project Prioritization</th>
<th>Cost</th>
<th>Primary Benefits</th>
<th>Benefit Extent</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1 – Roundabouts at S. Main Street and Village Road (Scenario B)</td>
<td>$5.0M - $6.7M</td>
<td>Improves corridor flow and optimize pedestrian and vehicular safety and operations</td>
<td>★★★★★</td>
</tr>
<tr>
<td>#2 – Roundabout at Watson Avenue (Scenario C)</td>
<td>$2.0M - $2.7M</td>
<td>Increase transit reliability and ridership</td>
<td>★★★★★☆</td>
</tr>
<tr>
<td>#3 – Roundabout at N. French Street (Scenario D)</td>
<td>$2.0M - $2.7M</td>
<td>Increase transit reliability and ridership</td>
<td>★★★★★☆</td>
</tr>
<tr>
<td>#4 – Roundabout at County Road 450 (Scenario D)</td>
<td>$2.4M - $3.3M</td>
<td>Improve pedestrian safety and traffic calming effects</td>
<td>★★★★☆☆</td>
</tr>
<tr>
<td>#5 – Roundabout at Airport Road (Scenario D)</td>
<td>$1.4M - $1.9M</td>
<td>Corridor continuity and accommodate traffic growth</td>
<td>★★★☆☆☆</td>
</tr>
<tr>
<td>#6 – Roundabout at Ski Hill Road (Scenario D)</td>
<td>$2.6M - $3.5M</td>
<td>Corridor continuity and accommodate traffic growth</td>
<td>★★★☆☆☆</td>
</tr>
<tr>
<td>#7 – Roundabouts at Boreas Pass Road and/or Valley Brook St. (Scenario D)</td>
<td>$4.8M - $6.6M</td>
<td>Future development may trigger capacity improvements</td>
<td>★☆☆☆☆☆</td>
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<tr>
<td><strong>Priority Cost Range (in Million $’s)</strong></td>
<td><strong>$20.2M - $27.4M</strong></td>
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</tr>
</tbody>
</table>

*Note: Costs do not include grade separated pedestrian crossing structures*
Conclusions

• Roundabouts on Park Avenue Corridor
  • Roundabouts are feasible on the corridor

• Highest Benefits for Traffic Congestion
  • South end of corridor (Village, S. Main)
  • High volumes contributes significantly to traffic congestion on the south side of the corridor
  • Near the Transit Station (Watson)
## TABLE 11: SUMMARY OF OPINION OF PROBABLE COSTS

<table>
<thead>
<tr>
<th>#</th>
<th>Intersection</th>
<th>OPC Cost</th>
<th>ROW Area (sf)</th>
<th>ROW Cost</th>
<th>Cost w/ ROW</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Borras Pass Rd. and S. Main St.</td>
<td>$3,220,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>South Park Ave. and S. Main St.</td>
<td>$3,290,000</td>
<td></td>
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</tr>
<tr>
<td>3</td>
<td>Village Rd. and South Park Ave.</td>
<td>$2,240,000</td>
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<tr>
<td>4</td>
<td>Ski Hill Rd. and South Park Ave.</td>
<td>$2,870,000</td>
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<tr>
<td>5</td>
<td>Watson Ave. and North Park Ave.</td>
<td>$1,680,000</td>
<td></td>
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<tr>
<td>6</td>
<td>N. French St. and North Park Ave.</td>
<td>$1,700,000</td>
<td></td>
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<tr>
<td>7</td>
<td>Airport Rd. and North Park Ave.</td>
<td>$1,740,000</td>
<td></td>
<td></td>
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<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>$16,740,000</strong></td>
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<td>1</td>
<td>Borras Pass Rd. and S. Main St.</td>
<td>$3,220,000</td>
<td>350</td>
<td>$17,500</td>
<td>$3,237,500</td>
</tr>
<tr>
<td>2</td>
<td>South Park Ave. and S. Main St.</td>
<td>$3,290,000</td>
<td>-</td>
<td>$ -</td>
<td>$3,290,000</td>
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<tr>
<td>3</td>
<td>Village Rd. and South Park Ave.</td>
<td>$2,240,000</td>
<td>2,190</td>
<td>$109,500</td>
<td>$2,349,500</td>
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<tr>
<td>4</td>
<td>Ski Hill Rd. and South Park Ave.</td>
<td>$2,870,000</td>
<td>2,960</td>
<td>$148,000</td>
<td>$3,018,000</td>
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<tr>
<td>5</td>
<td>Watson Ave. and North Park Ave.</td>
<td>$1,680,000</td>
<td>3,570</td>
<td>$178,500</td>
<td>$1,858,500</td>
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<td>6</td>
<td>N. French St. and North Park Ave.</td>
<td>$1,700,000</td>
<td>3,550</td>
<td>$177,500</td>
<td>$1,877,500</td>
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<tr>
<td>7</td>
<td>Airport Rd. and North Park Ave.</td>
<td>$1,740,000</td>
<td>1,600</td>
<td>$80,000</td>
<td>$1,820,000</td>
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<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>$16,740,000</strong></td>
<td><strong>14,220</strong></td>
<td><strong>$711,000</strong></td>
<td><strong>$17,451,000</strong></td>
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Project Prioritization #2:
Roundabout at Watson/French (Scenario C)

- Transit Mitigation Strategy
- Roundabout at Watson or French
  - Location of Transit Station
  - Existing Location
- Access Control
Key Issues to Solve For at Main St and Village Rd

- Resolve mid-block pedestrian crossing
- Determine intersection type
  - Consider pedestrian grade separation
  - Consider at grade mid-block signalized crossing
- 800-1200 pedestrians/hour during current peaks
Ongoing Parking Management