

Earning Acceptance of Complicated Concepts in a Freeway Project Using a Modified VA Process

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Toronto, Ontario
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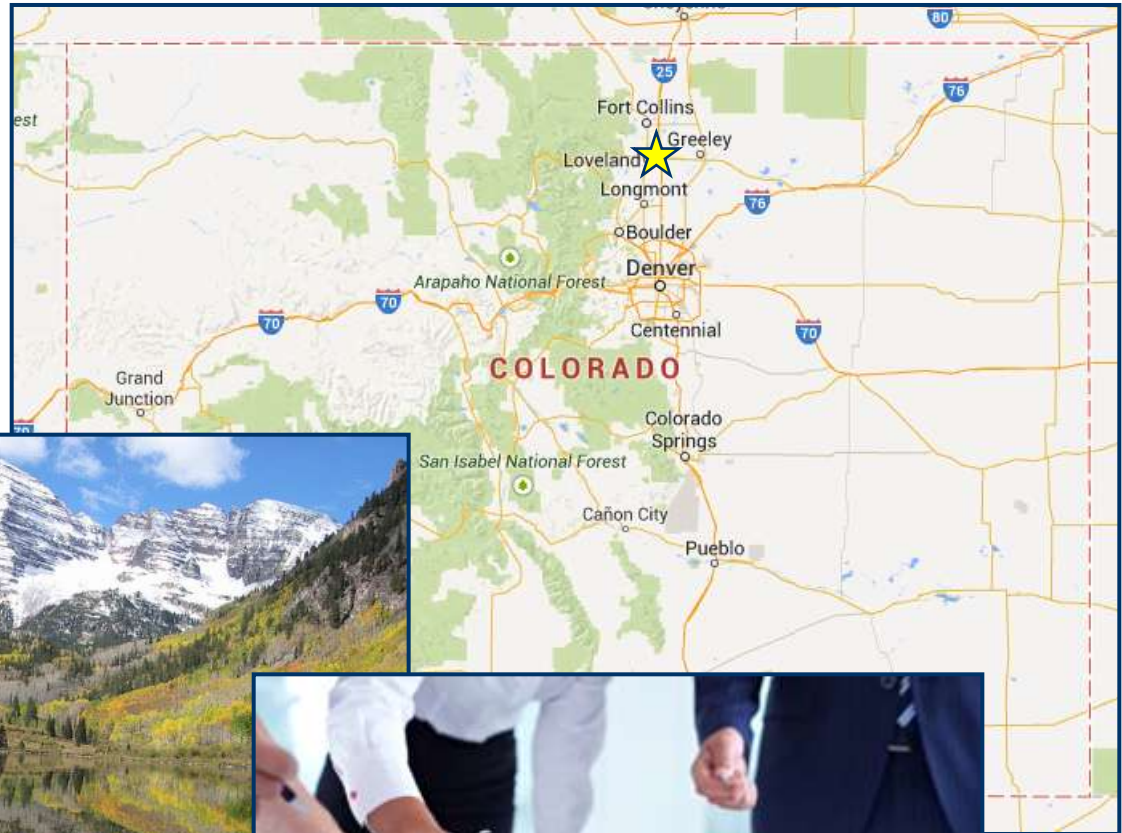
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Topic Overview

- *AECOM and the Colorado Department of Transportation (CDOT) conducted a Value Engineering (VE) Study for the I-25/U.S. 34 Interchange in Larimer County. The study looked at capital cost improvements, improved constructability, and providing the basic functional requirements of the project.*
- *The study was completed in two workshops, separated by three months to provide time for a thorough evaluation of the alternatives developed in the initial workshop.*

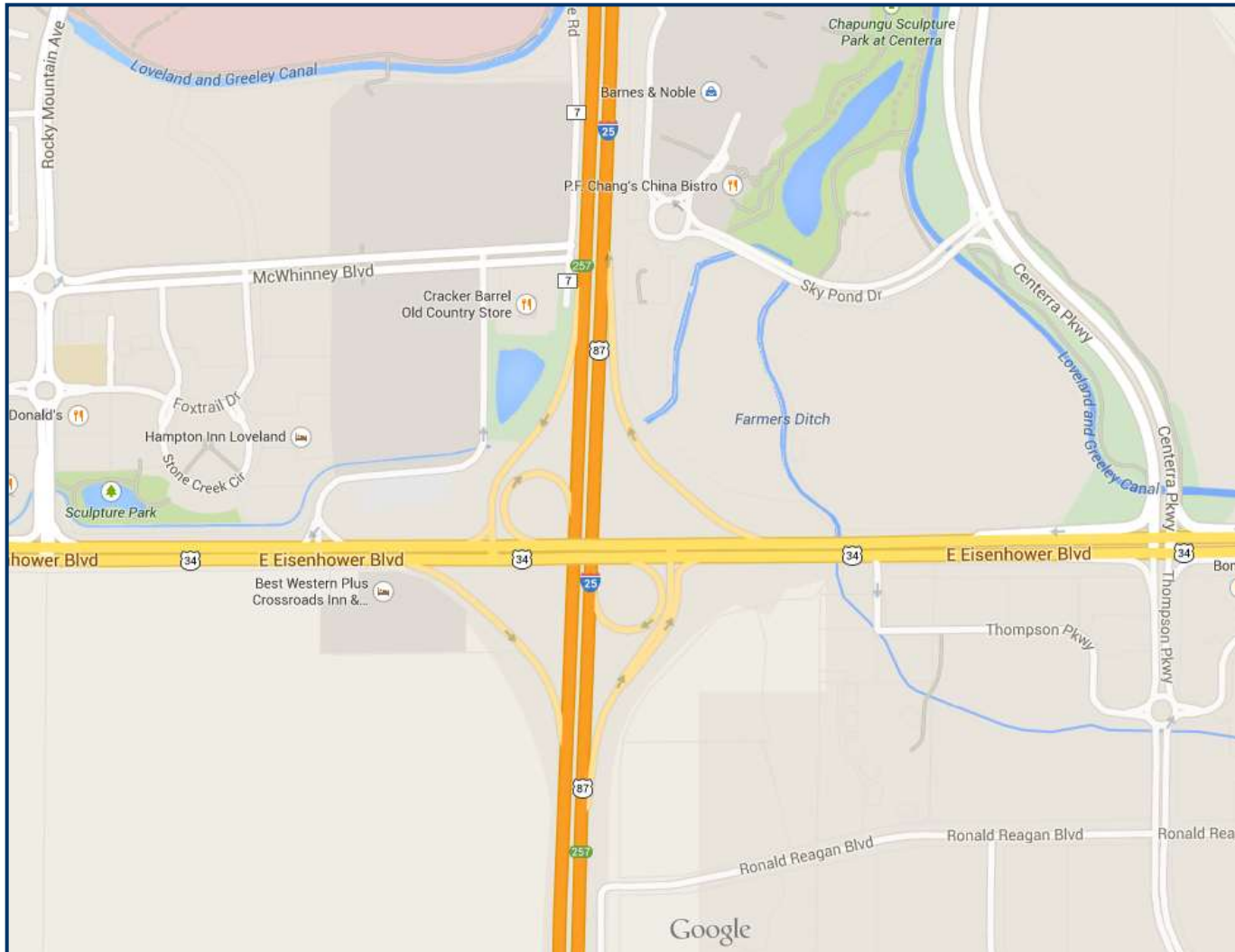
Colorado VE Study

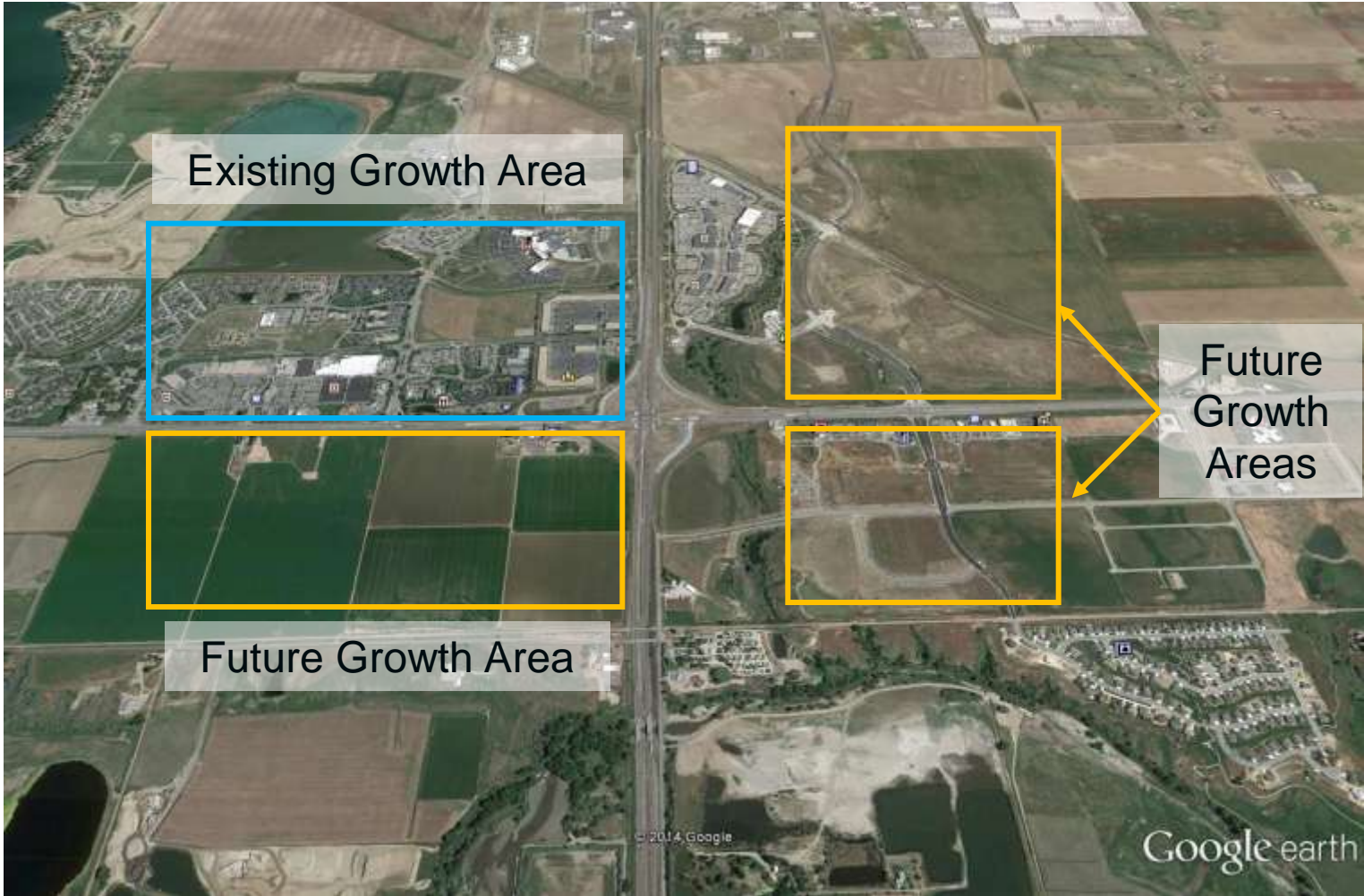


I-25/U.S. 34 Interchange



I-25/U.S. 34 Interchange





I-25/U.S. 34 Interchange



Issues

Increased Traffic Congestion



Lack of Modal Alternatives

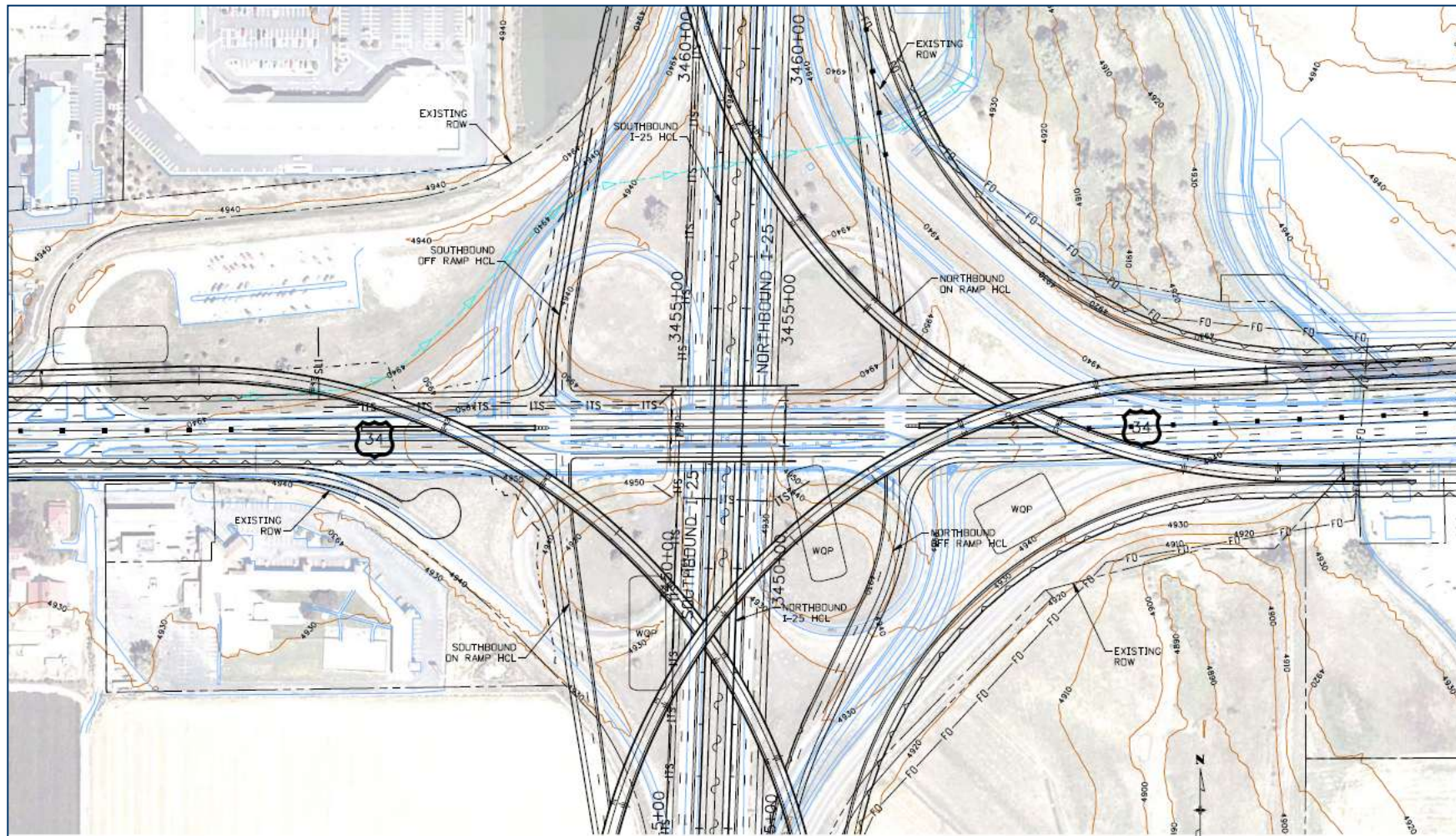


Increased Frequency and Severity of Crashes

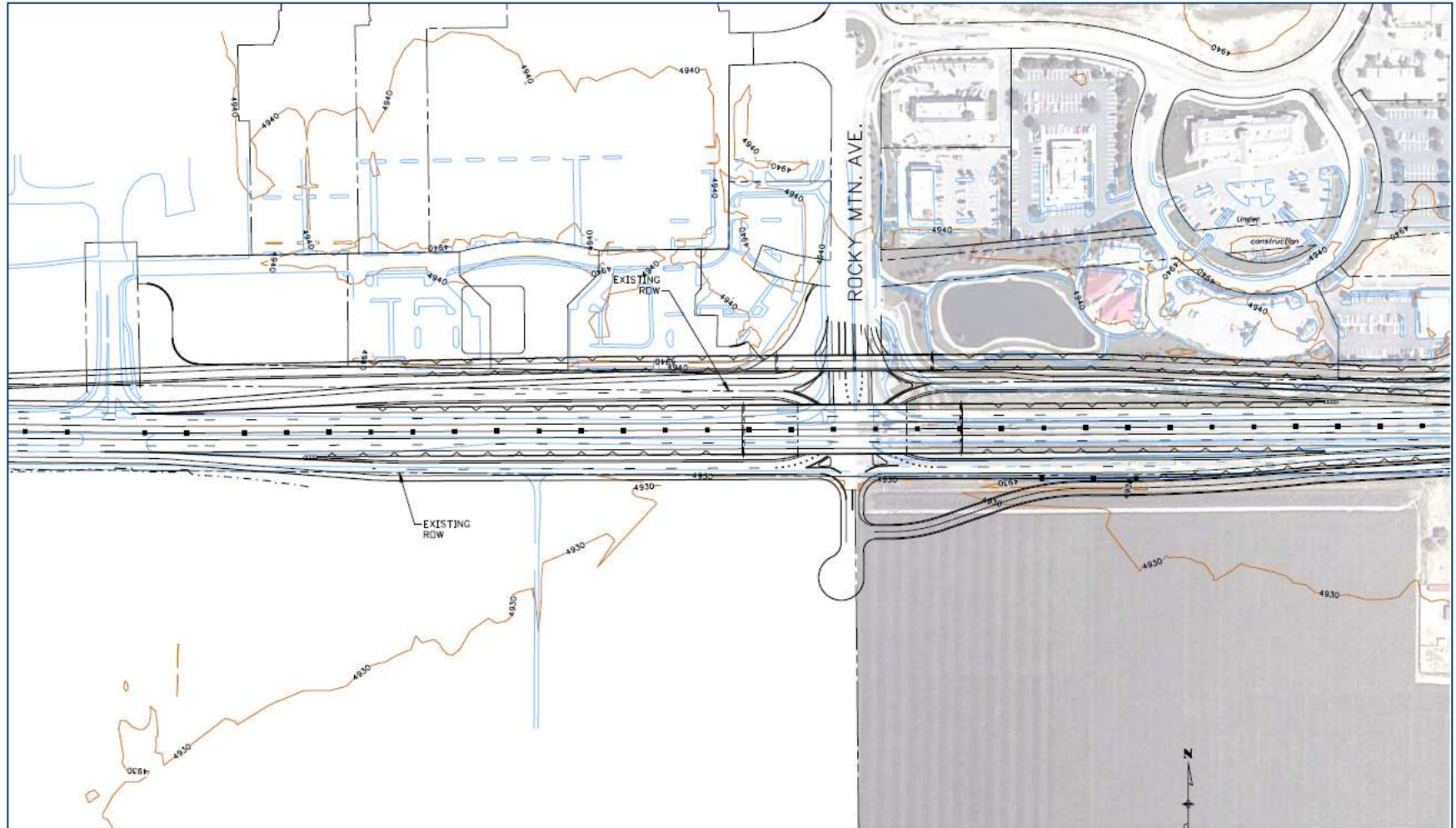


Aging and Functionally Obsolete Infrastructure

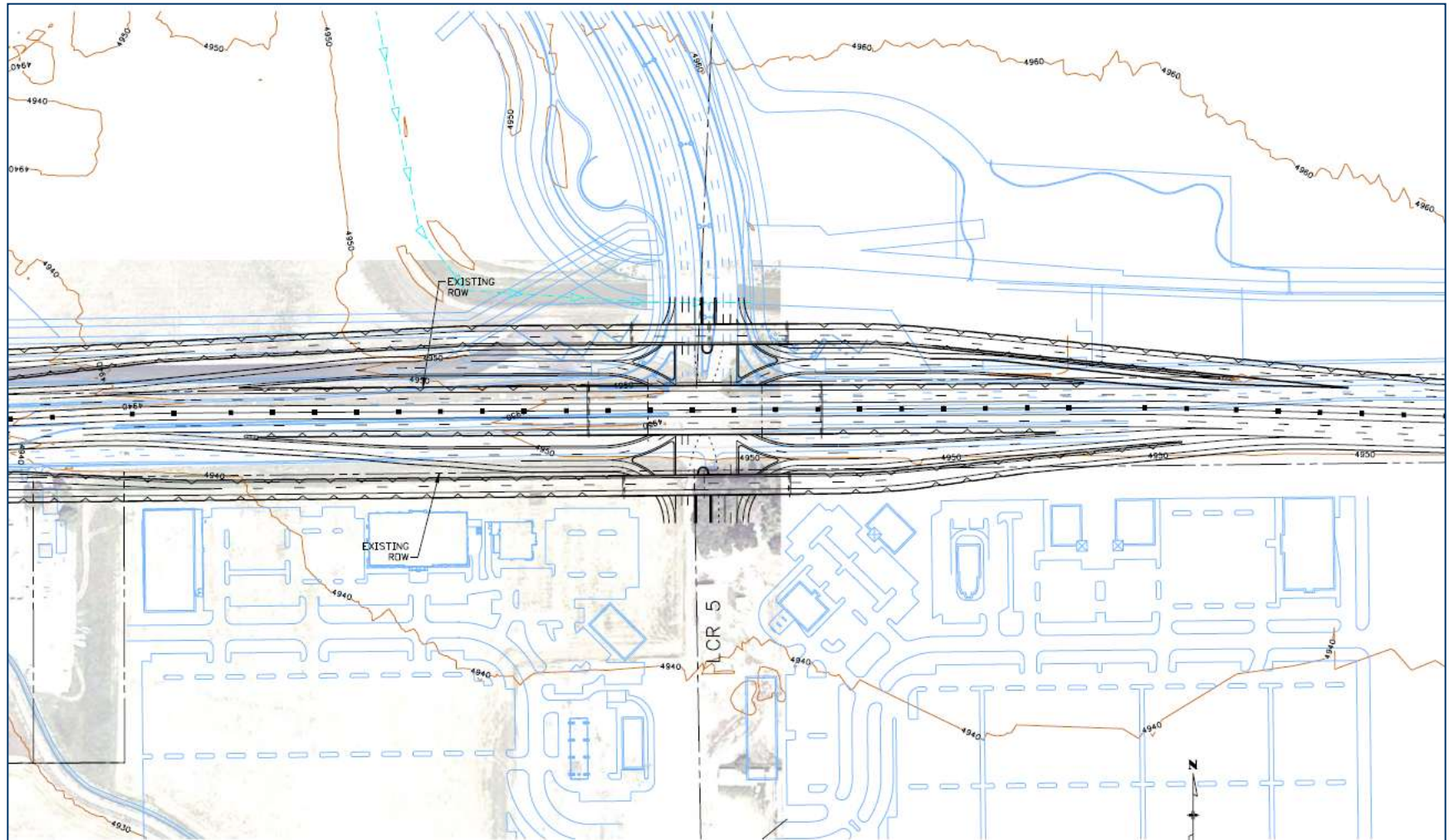
Baseline Design – I-25/U.S. 34



Baseline Design – To West of Interchange

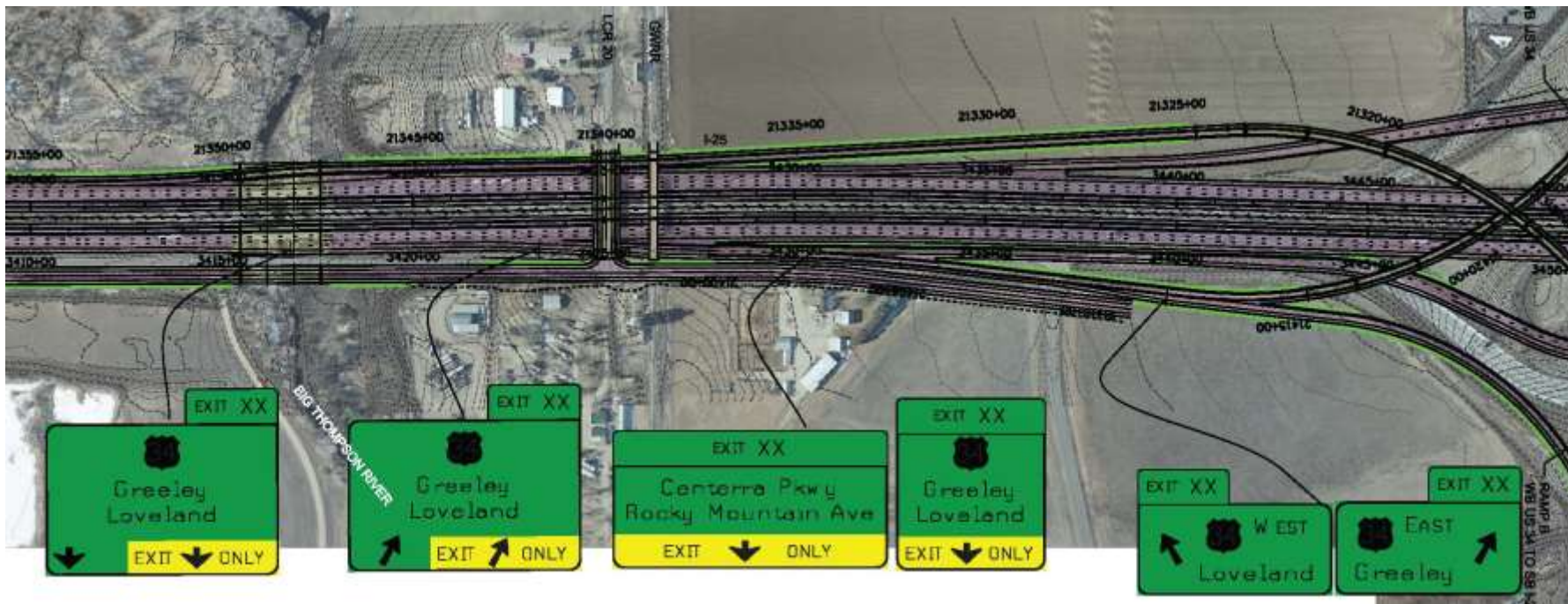


Baseline Design – To East of Interchange

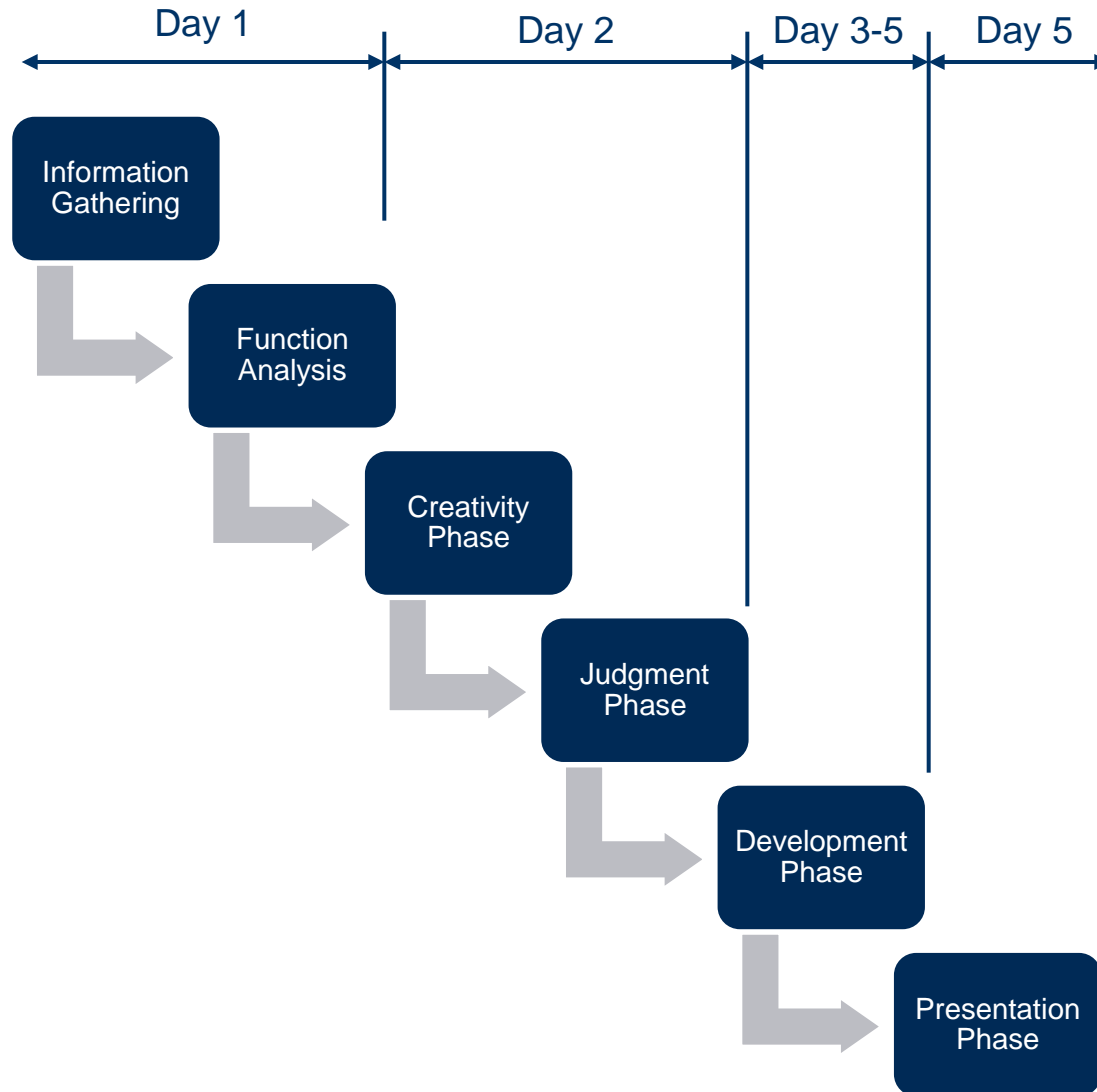


Baseline Design Challenges

- I-25 Shared NB Off-Ramps Configuration



Typical 5 Day Workshop



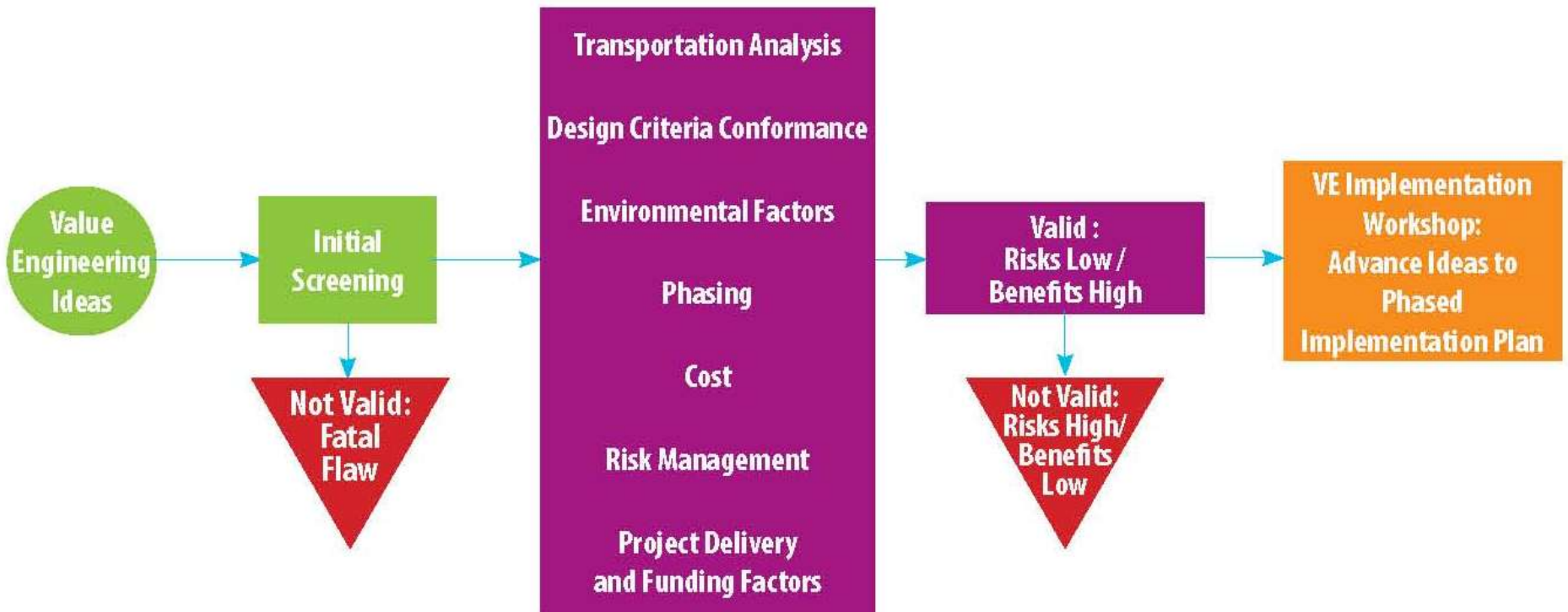
The Revised VE Process

Creative Phase
Initial VE Workshop

Change Phase
Analysis

Package Phase
Final VE Workshop

Present Phase
Implement



Initial VE Workshop

Creative Phase

- 52 initial ideas;
- 7 fatal flawed;
- 33 Advance to Change Management Phase

Change Management Phase

- 10 VE Concepts still active

Break Between Workshops

Change Phase Analysis

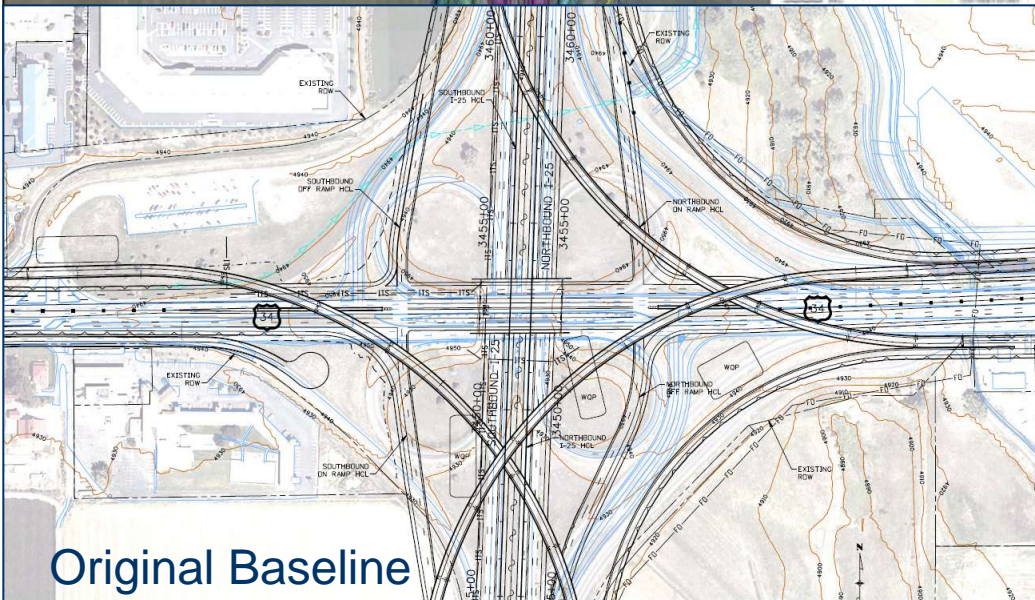
- Full geometric design of alternatives
- Detailed traffic modeling
- Confirm whether the ideas work
- Bring forward best alternatives for approval

Final VE Workshop

Package Phase

- Reduced ideas that were in direct conflict with one another
- Combined ideas that worked well together
- Created packages for presentation
- Explored
 - Pros/Cons
 - Phasing/Costs
 - Operational Benefits
 - Longevity
 - Risks and Next Steps

Final VE Workshop Alternatives

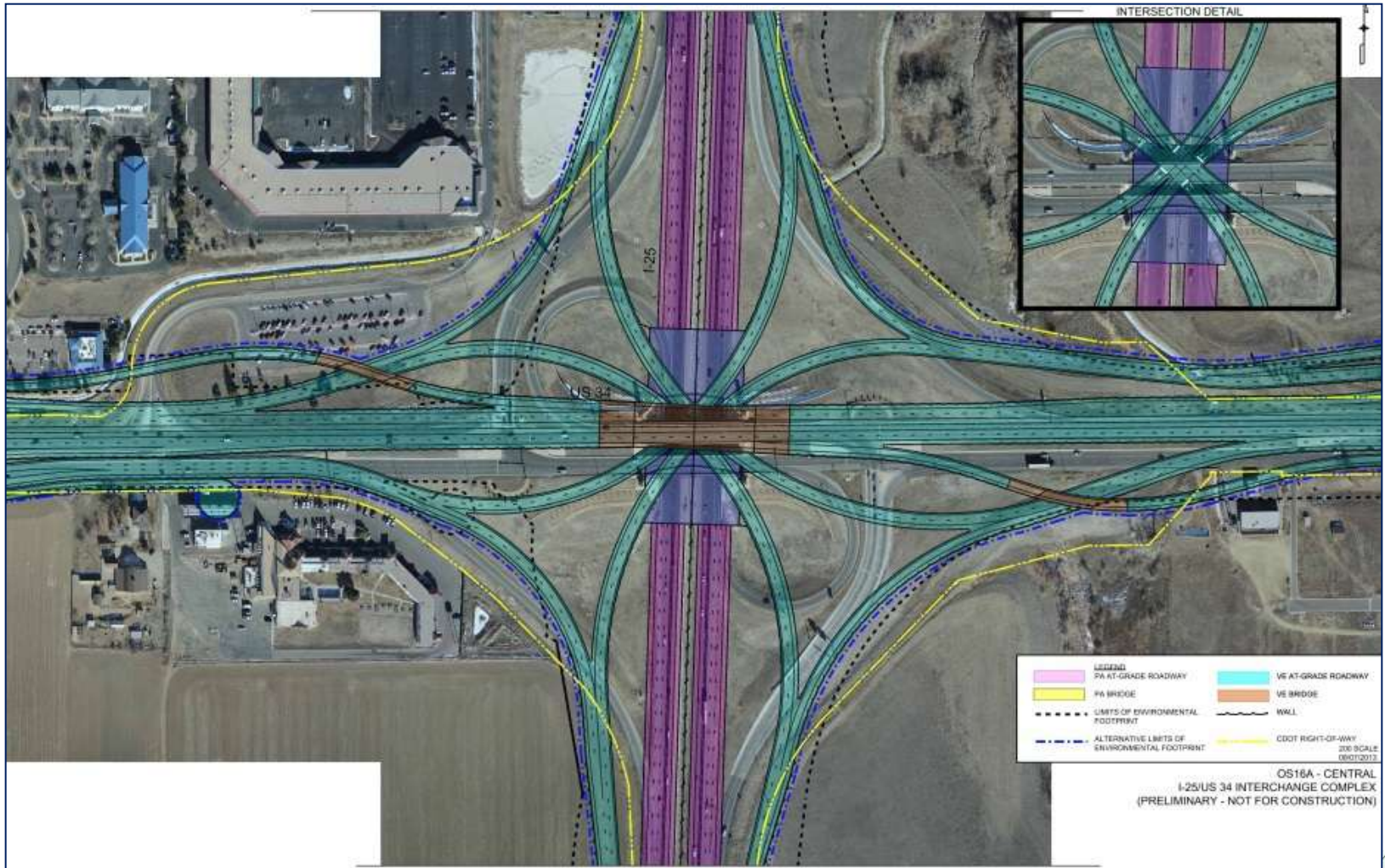


Improved Baseline Design

- Add SB I-25 to WB US34 ramp
- No 4th level NB I-25 to US 34 ramp
- Improvements to ramps

Final VE Workshop Alternatives

SPUI at I-25/US 34 Design



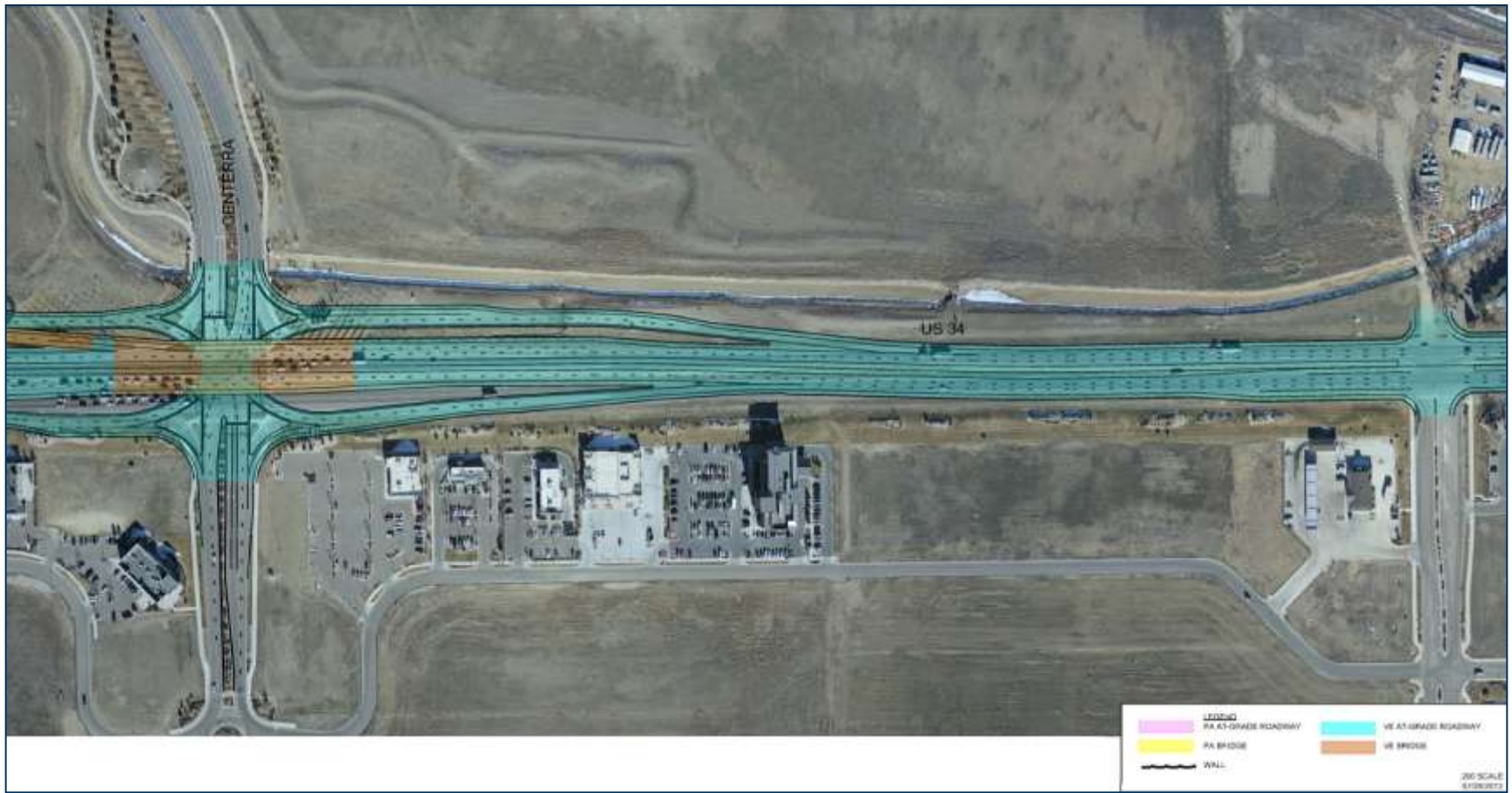
Final VE Workshop Alternatives

SPUI at I-25/US 34 Design – To West of Interchange

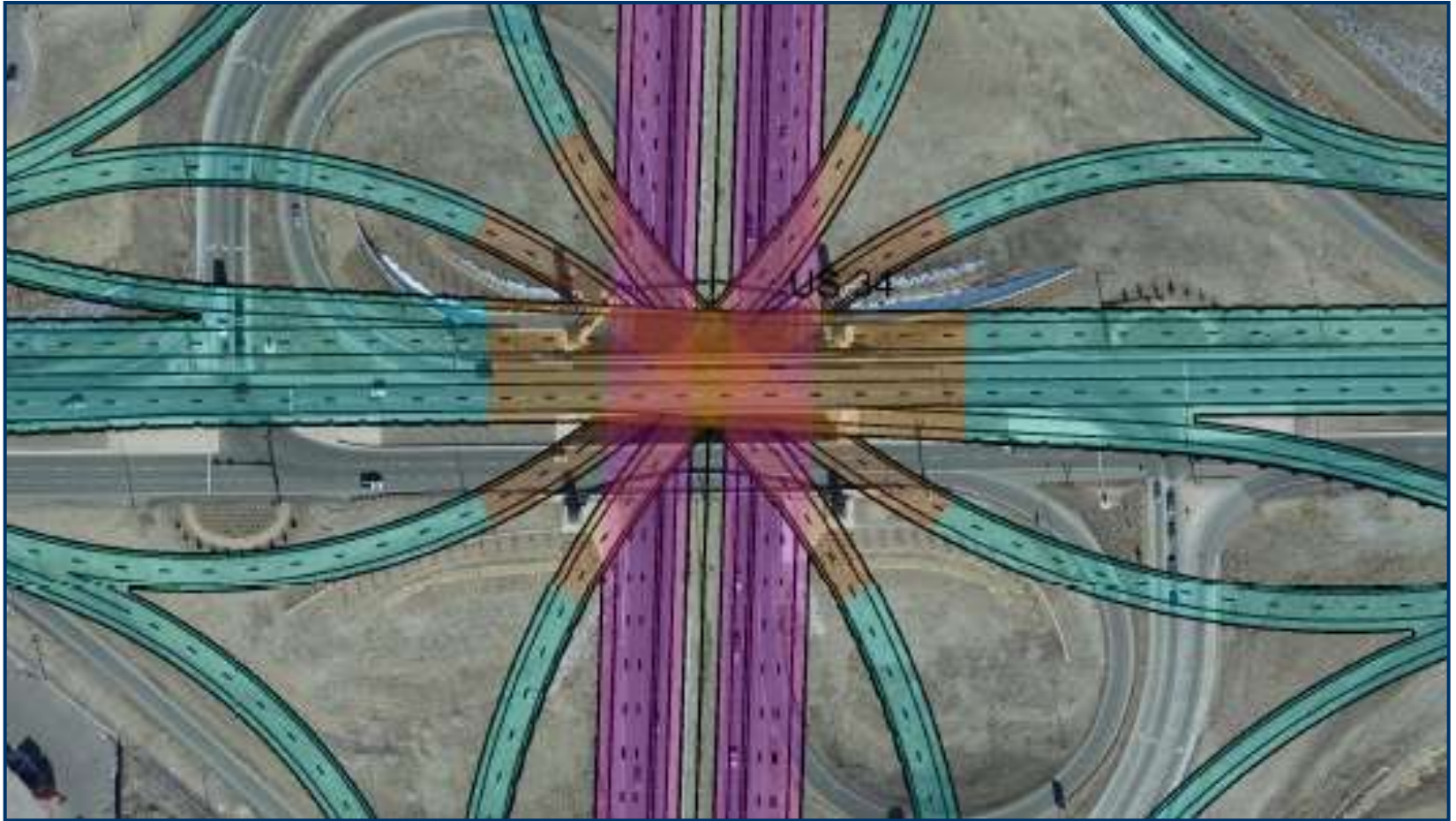


Final VE Workshop Alternatives

SPUI at I-25/US 34 Design – To East of Interchange



Stacked SPUI



Single Point Urban Interchange (SPUI)



Pros/Cons

Improved Baseline Design (Pros)	SPUI at I-25/US 34 Design (Pros)
Less capital cost	<i>Substantially</i> less capital cost
Construct components over time	Reduces weaving and stops/delays on US 34
Flexibility to add NB to WB D.C.	Less driver confusion/no duplicate destination ramps

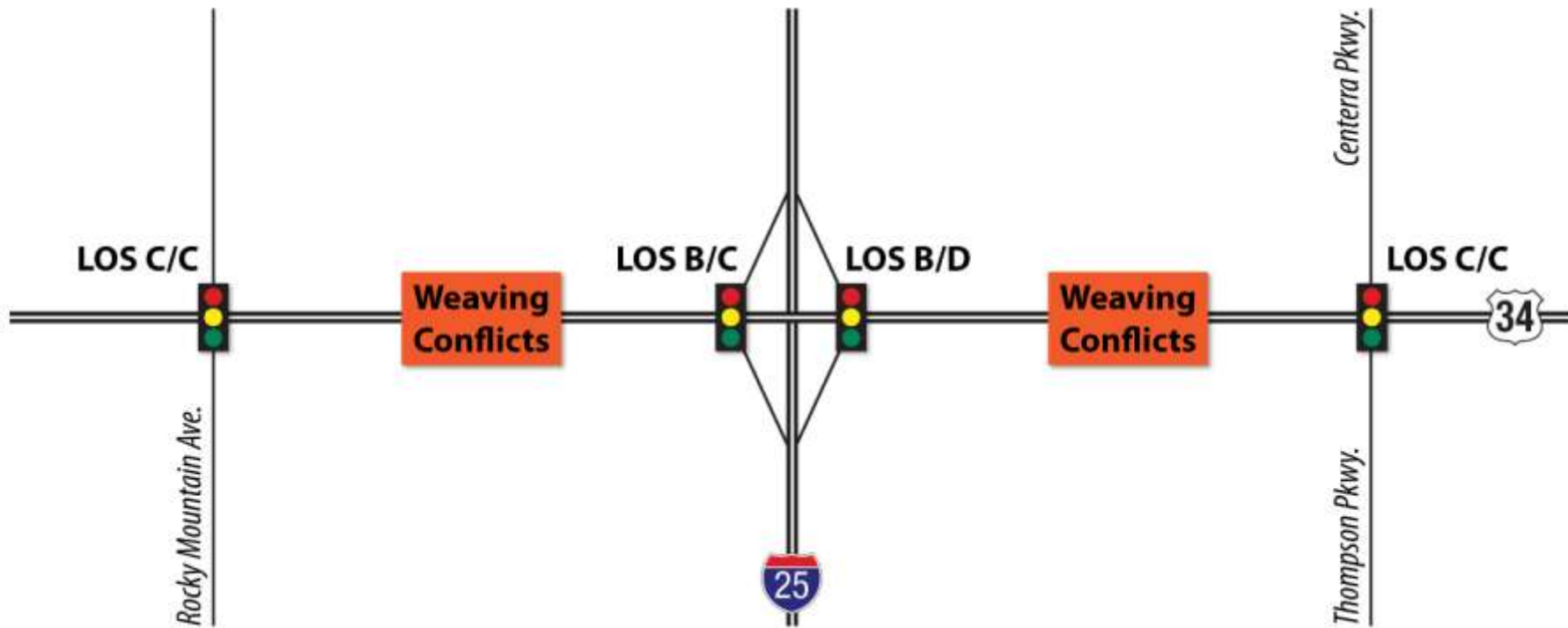
Pros/Cons

Improved Baseline Design (Cons)	SPUI at I-25/US 34 Design (Cons)
Higher ROW impact in NE quadrant	More process for approval including federal and local coordination
2-lane NB I-25 off-ramp expands to 4 to 5-lanes at the Diamond Interchange ramp terminal	Less phase-able with higher throw-away costs between phases
Weave section to the east intensified in the short-term	Direct connect ramp traffic stops at a signal

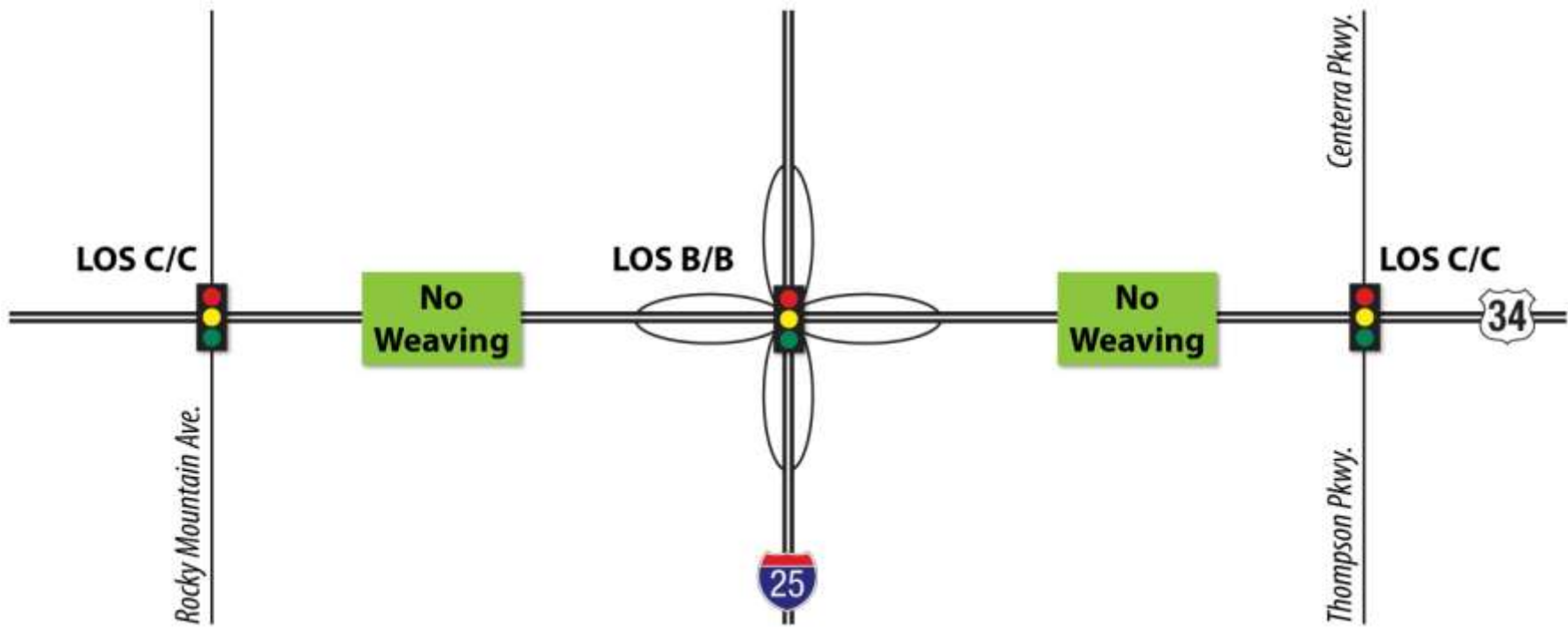
Cost Savings Summary

- Compared to Original Baseline Design costs
 - Improved Baseline Design reduced costs by \$16M
 - SPUI at I-25/US 34 Design reduced costs by \$70M

Operations – Improved Baseline Design



Operations - SPUI at I-25/US 34 Design



Longevity

- Improved Baseline Design
 - Weaving on US 34 continues to be an operational issue beyond 2035
- SPUI at I-25/US 34 Design
 - Weaving on US 34 is greatly improved, with additional SPUI capacity remaining beyond 2035

Final VE Workshop Recommendations

- Both Design Alternatives
 - Provide lower capital cost, with SPUI at I-25/US 34 offering significantly more reduction
 - Provide improved operations
 - Require federal and local agency coordination

Given the high potential reduction in overall capital cost and potential to function as good or better overall, **the SPUI at I-25/US 34 was recommended.**

Benefit of Multiple Workshops

- Time to research and evaluate alternatives
- Decision makers are more likely to consider new ideas if greater detail is provided
- Opportunity to see if unique ideas are feasible
- Improve the likelihood of a “Yes” response

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