

Project Advisory Committee (PAC) Meeting #2

September 19th, 2019



Meeting Purpose & Agenda

- Purpose
 - Understand the Tier 1 alternatives, evaluation criteria, and results
 - Provide feedback on the Tier 1 alternatives
- Agenda
 - Welcome
 - Presentation
 - Recap from PAC Meeting #1
 - Business and property owner outreach
 - Tier 1 alternatives, evaluation criteria, and results
 - Initial recommendations for Tier 2
 - Review Tier 1 alternatives (break-out session)
 - Next steps and meeting close



Introductions

- Name
- Who you represent?
- Have you heard anything related to this intersection?

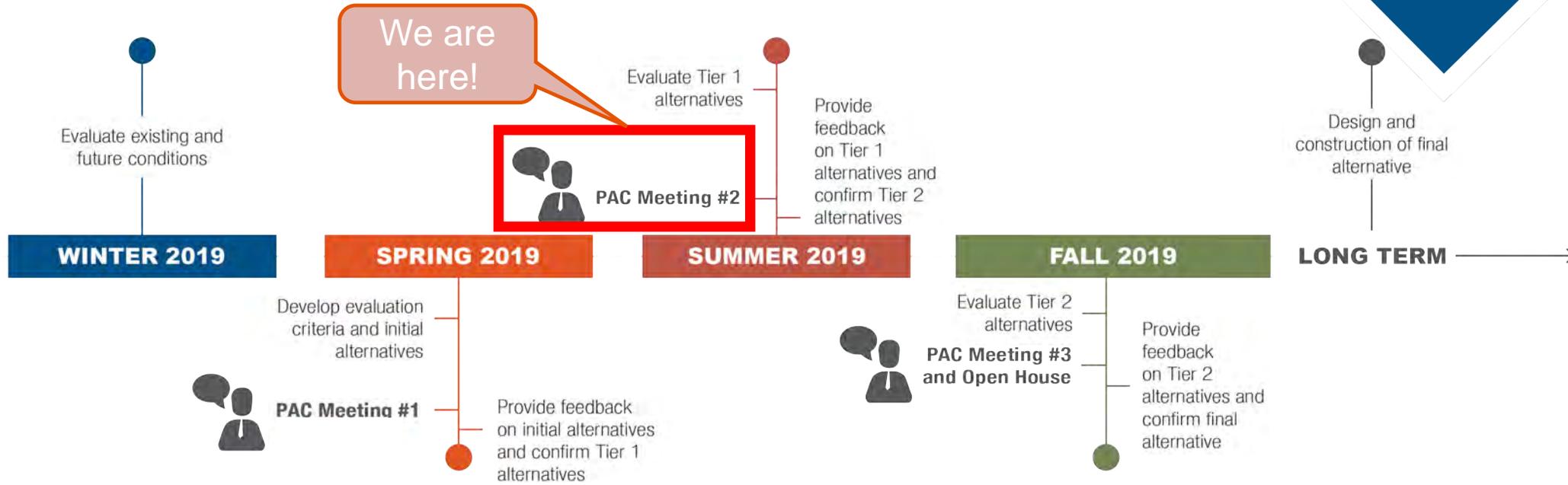


Study Objectives

- Facilitate an open, honest, and transparent decision-making process
- Improve traffic operations at the intersection and the pedestrian and bicycle environment
- Improve pavement and area drainage



Schedule



- Other Activities**
- Survey
 - Geotechnical
 - Hydraulics
 - Environmental
 - Utilities





Recap from PAC Meeting #1



Action Items from PAC Meeting #1

1. Post meeting materials on website www.mdt.mt.gov/pubinvolve/expofirst
 - Materials posted on website.
2. Schedule next PAC Meeting in September
 - We are here today!



Action Items from PAC Meeting #1 (cont'd)

3. Perform further traffic analysis on MetraPark connection
 - Benefits to Exposition Drive
 - Impacts to Airport/Main and Bench/New Connection
 - Consider adding to long range transportation plan and assessing after Bypass is in place

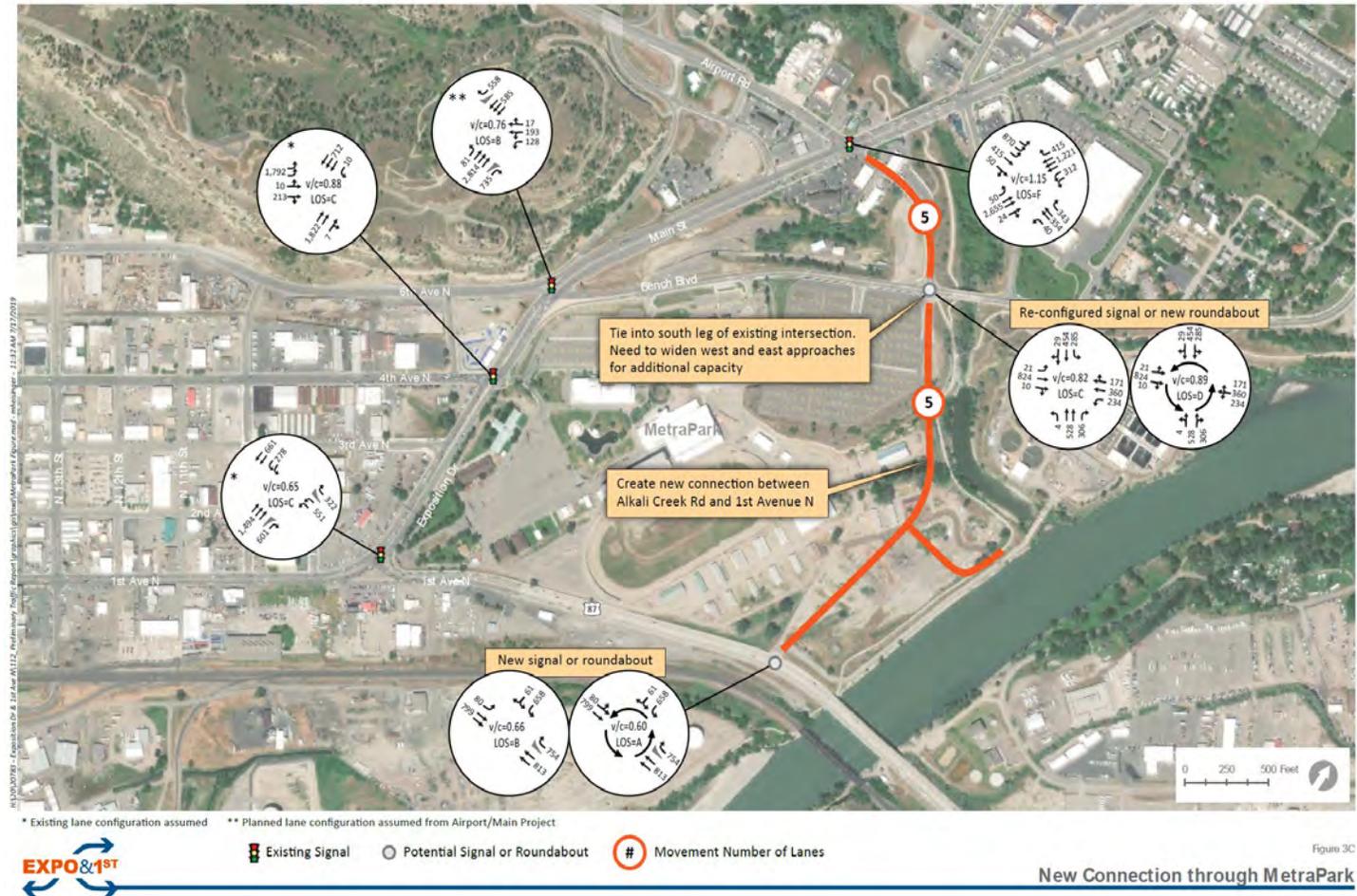


Figure 3C
New Connection through MetraPark

Action Items from PAC Meeting #1 (cont'd)

4. Investigate a maximized pedestrian/bicycle alternative

- Enhanced crossing at 4th Ave N
- New crossings at Expo/1st
- Pathways
 - Exposition Dr
 - 1st Avenue N
 - US 87 to Jim Dutcher Trail
- Detached sidewalks

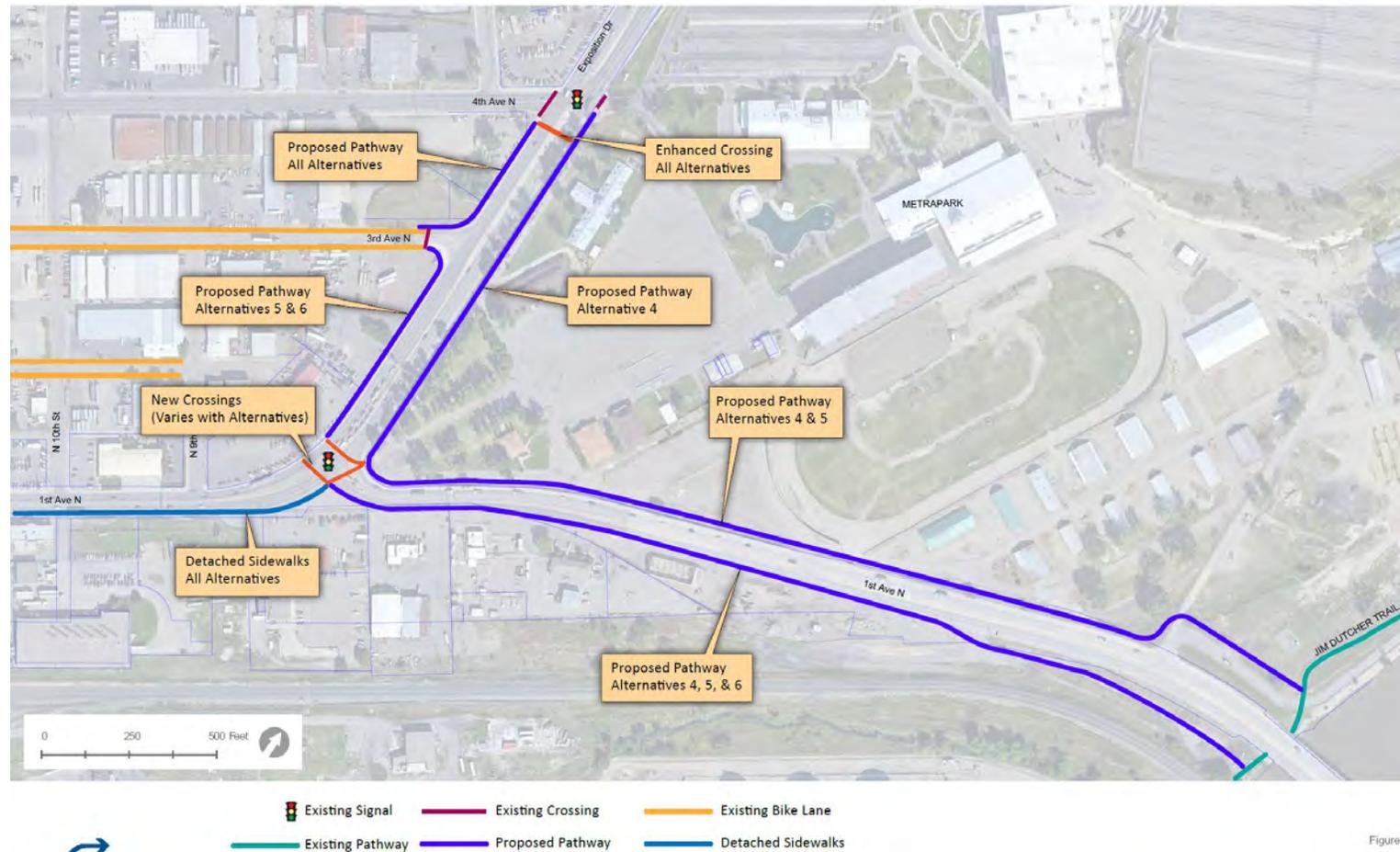


Figure 1

Action Items from PAC Meeting #1 (cont'd)

5. Provide additional information on displaced left-turn (DLT) lane safety / enforcement based on other State's experiences
 - The Utah Department of Transportation installed DLT intersections at seven locations on the Bangerter Highway.
 - Crashes reduced by as much as 60 percent
 - https://safety.fhwa.dot.gov/intersection/innovative/crossover/case_studies/salt_lake/dlt_bngrtr_3500.pdf
 - Agencies implement education and outreach program during construction.

U.S. Department of Transportation
Federal Highway Administration

Bangerter Corridor, Salt Lake County, UT
DISPLACED LEFT TURN INTERSECTION

THE PROBLEM
The Bangerter Highway corridor had a high crash rate and heavy delays. At some intersections, 25 percent of the signal time was devoted to left turns onto the minor roads, impeding both through traffic and traffic on the minor roads.

THE SOLUTION
Installation of two-legged and four-legged DLT intersections at seven locations on the corridor to help alleviate congestion and improve flow.

THE OUTCOME

- Commute time along the corridor has been reduced by 3 ½ minutes.
- More than 800,000 gallons of fuel have been saved.
- Construction costs have been reduced by \$20-40 million.
- Crashes within ¼ of a mile of the initially treated intersection have been reduced by as much as 60 percent.
- Capacity along the corridor has increased by as much 20-50 percent, depending on the intersection.

CONTACT
Jeffrey Shaw, P.E.
FHWA Office of Safety
703-283-3524
jeffrey.shaw@dot.gov
Mark Doctor, P.E.
FHWA Resource Center
404-562-3732
mark.doctor@dot.gov

CORRIDOR LOCATION
40°41'47.8"N 111°58'51.4"W

Background
Bangerter Highway is a major north-south corridor stretching from Salt Lake International Airport in the north to an interchange with I-15 in the south. Prior to construction of a series of Displaced Left Turn Intersections (DLT), also known as Continuous Flow Intersections (CFI), Bangerter Highway experienced high crash rates and heavy delays.

Challenges
Utah DOT's (UDOT) primary challenge along the corridor was congestion. At some intersections, 25 percent of the signal time was devoted to left turns onto the minor roads, impeding both through and minor road traffic. This challenge was compounded by a high crash rate. Between 1994 and 2003, the intersection of Bangerter and 3500 South alone experienced 618 crashes, an average of more than one crash per week.¹

Approach
UDOT examined several ways to treat the intersection of Bangerter and 3500 South— both to reduce congestion and to improve safety. A VISSIM simulation comparing a DLT to no changes at this location showed significant operational improvements with the DLT. UDOT installed the DLT at Bangerter and 3500 South and observed how it improved both traffic flow and safety at the intersection. In addition to the decreased commute time of nearly 4 minutes and a 60 percent reduction in crashes near the intersection, UDOT found that the DLT could be constructed for about ¼ the cost of a grade-separated interchange.² This motivated UDOT to install an additional six DLTs along the corridor.



Left Turn Crossover at Bangerter Highway and 3500 South
Source: DLT Case Study Video FHWA-SA-14-059

Results
Choosing to apply DLTs saved the state hundreds of millions of dollars. Each new DLT intersection cost between \$6 and \$8 million. Freeway-like, grade-separated interchanges would have cost \$30 to \$50 million each and required the re-location of numerous local businesses.³

In addition to cost savings, capacity along the corridor has increased by as much as 20 to 50 percent, depending on the intersection.⁴ Safety also has improved, with crashes declining by 60 percent at some installations.⁵ Air quality improvements include emissions reductions that save more than 800,000 gallons of fuel previously wasted during congestion-related idling. Pedestrians and bicyclists also benefit from improvements such as overhead pedestrian walkways, signalized crosswalks, refuge islands, and bicycle lane striping.

¹ Lee Davidson, "Unusual Utah intersections improve safety, save money," The Salt Lake Tribune, November 19, 2012. Available at: <http://www.sltrib.com/stories/news/55293779-78/bangerter-south-million-cfa.html.csp>
² Wayne D. Cottrell and Sichun Mu, "Utah Intersection Safety - Requirement Crash Sites: Identification, Issues and Factors," Chapter 6, Study Intersections," Table 6.5, at <http://www.mountain-plains.org/publications/mplac06-08-178log6.htm>
³ Interview with Eric Rasband, Salt Lake City, UT, October 10, 2013.
⁴ Davidson, "Unusual Utah Intersections."
⁵ Interview with Eric Rasband, Salt Lake City, UT, October 10, 2013.
⁶ Davidson, "Unusual Utah Intersections."

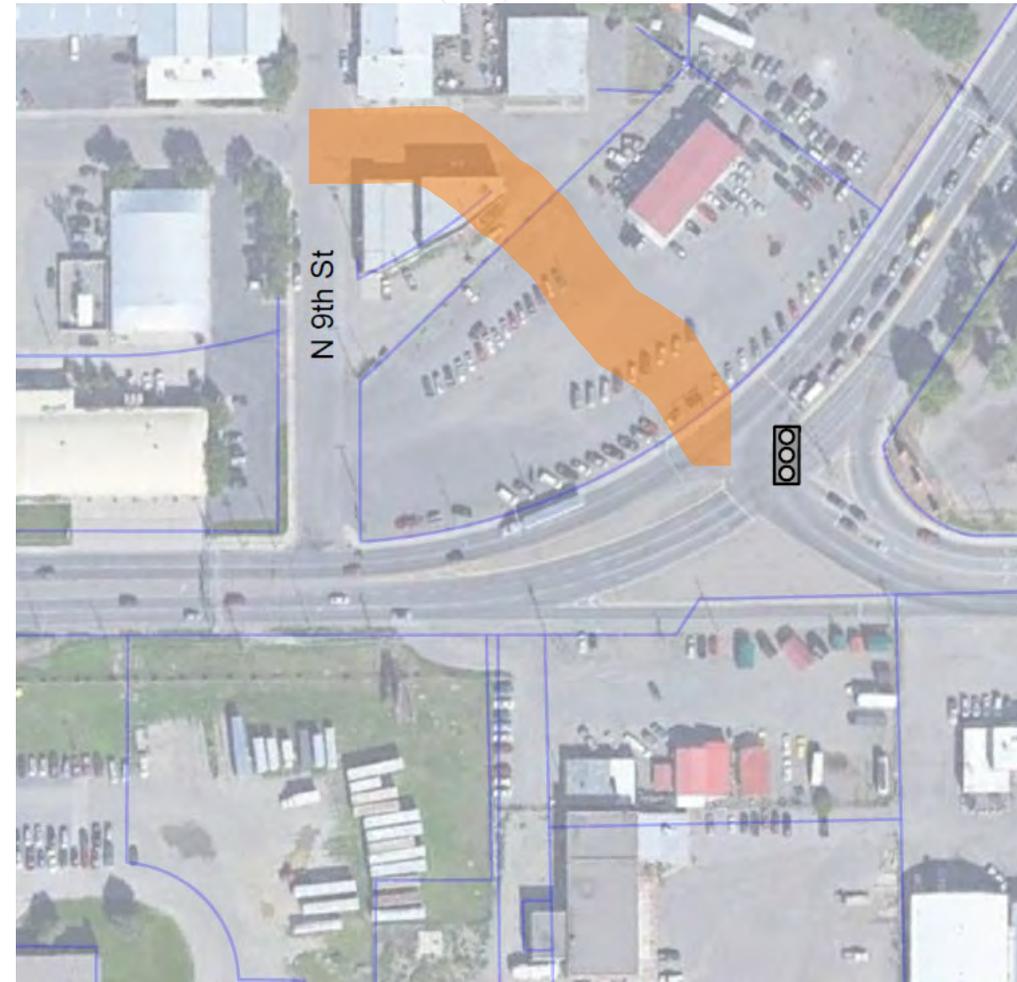
This Fact Sheet is a companion to the Video Case Study (FHWA-SA-14-059)

Safe Roads for a Safer Future
Investment in roadway safety saves lives
www.safety.fhwa.dot.gov

FHWA-SA-14-060

Action Items from PAC Meeting #1 (cont'd)

6. Follow up with City, County and MDT to see if connecting 2nd Avenue is a viable alternative to consider as part of this project
 - MDT's Systems Impact Process
 - Reached out to property/business owner for 1-on-1 meeting



PAC Support on Initial Alternatives to Move Forward for Further Evaluation

- No Build (3)
 - Westbound Shared Left/Right-Turn Lane or Single Westbound Left-Turn Lane and Dual Westbound Right-Turn Lanes (4)
 - *Note: This option is split into two alternatives for Tier 1.*
 - Free Westbound Right-Turn Lane + 4th Northbound Through Lane (5)
 - Dual Westbound Right-Turn Lanes (5)
 - Displaced Left-Turn Intersection (3)
-
- New Connection through MetraPark (2)
 - Multilane Roundabout (1)
 - Extend Exposition Drive to I-90 (1)
 - Grade Separation (1)





Business and Property Owner Outreach

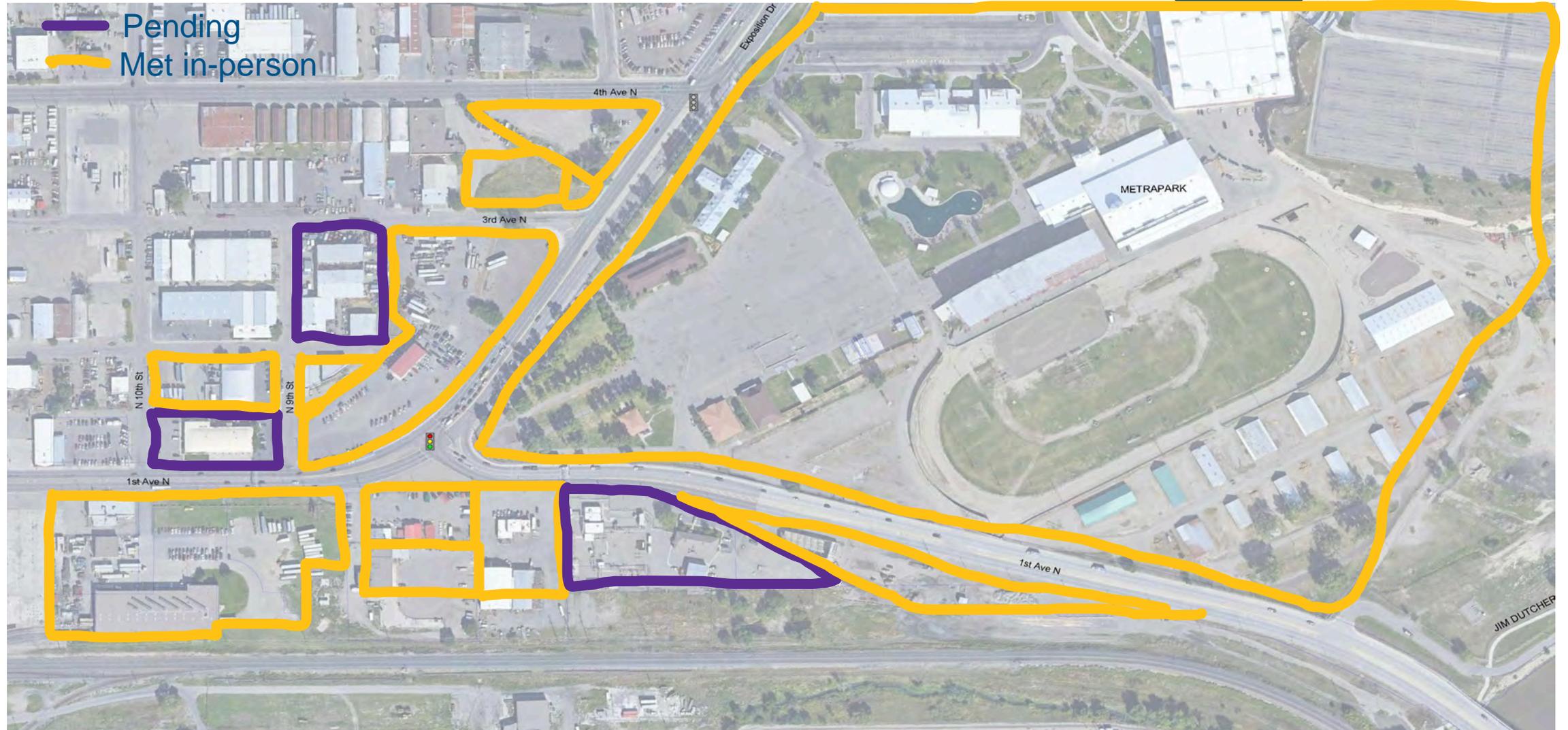


Outreach Effort to Date

- Invite to participate on PAC
 - A&I Distributors
 - Berry's Cherries
- Sent meeting invitation to 20 businesses and property owners
- Door-to-door and 1-on-1 meetings over the last two days



Business and Property Owner Outreach Map



Business and Property Owners

- Northern Broadcasting System
- Beyond the Box, Inc.
- AutoMagic
- A&I Distributors
- Berry's Cherries
- Billings Machine & Welding Shop
- Pace Analytical
- Tazman Geoscience
- Kay Bollinger
- Charlie Yegen
- MetraPark
- Yellowstone County
- Phillips 66
- Montana Rail Link
- Montana Department of Transportation



What We Heard?

- Deficiencies or concerns
 - Westbound right-turn has a high volume and backs up daily.
 - Challenging during events at MetraPark
 - Southbound left-turns are challenging for trucks.
 - Northbound right-turn lane
 - The skew / slip lane is unsafe.
 - Provides smooth operation, easy access for vehicles leaving town.
 - Pedestrians cross all over the place today.
 - Pedestrians use the bridge crossing located on north side.
 - Pedestrian crossings at the intersection would be unsafe given the high traffic volumes.
 - Impacts to property with project.
 - Access is difficult on south side of 1st Avenue N.
 - Several cross-access easements are in place.
 - Another cross-access easement is being explored by one property.



What We Heard?

- Positive reaction to the following:

- Intersection project—glad to see the project happening.
- Westbound right-turn lane changes
- Northbound right-turn lane alignment
- Pathway on Exposition Drive
- Pathway on 1st Avenue N (US 87) to Jim Dutcher Trail (locate on the north side)
- Pedestrian crossing realignment at 4th Ave
- Pedestrian crossings at 1st Avenue N & Exposition Drive

- Some interest in the following:

- Displaced left-turn (longer term improvement)
- Free or 2nd northbound right-turn lane
- New signal at 10th Street / 1st Avenue N
- 2nd Avenue N connection
- Explore other access options for properties on the south side (possible backage roadway was discussed)

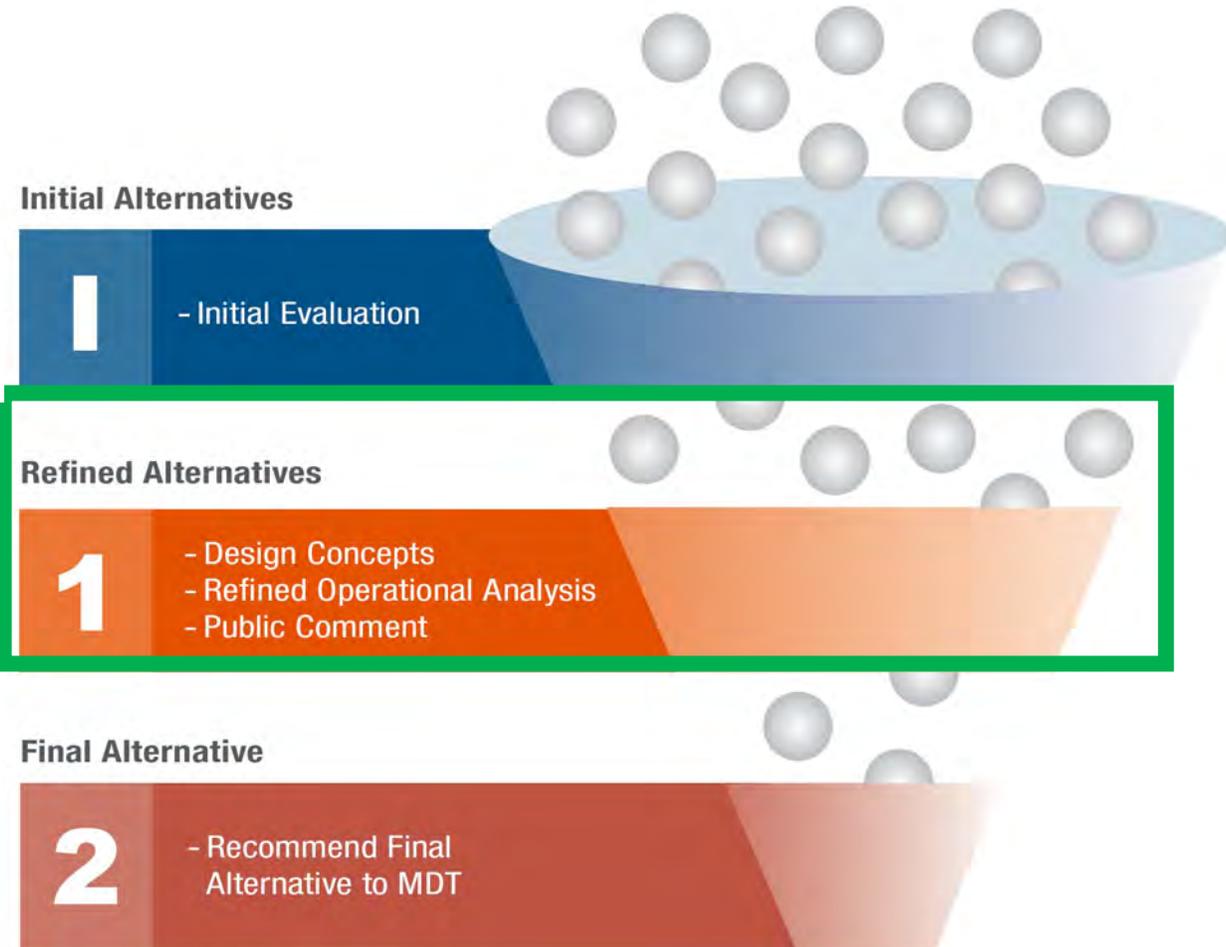




Tier 1 Alternatives



Tiered Approach

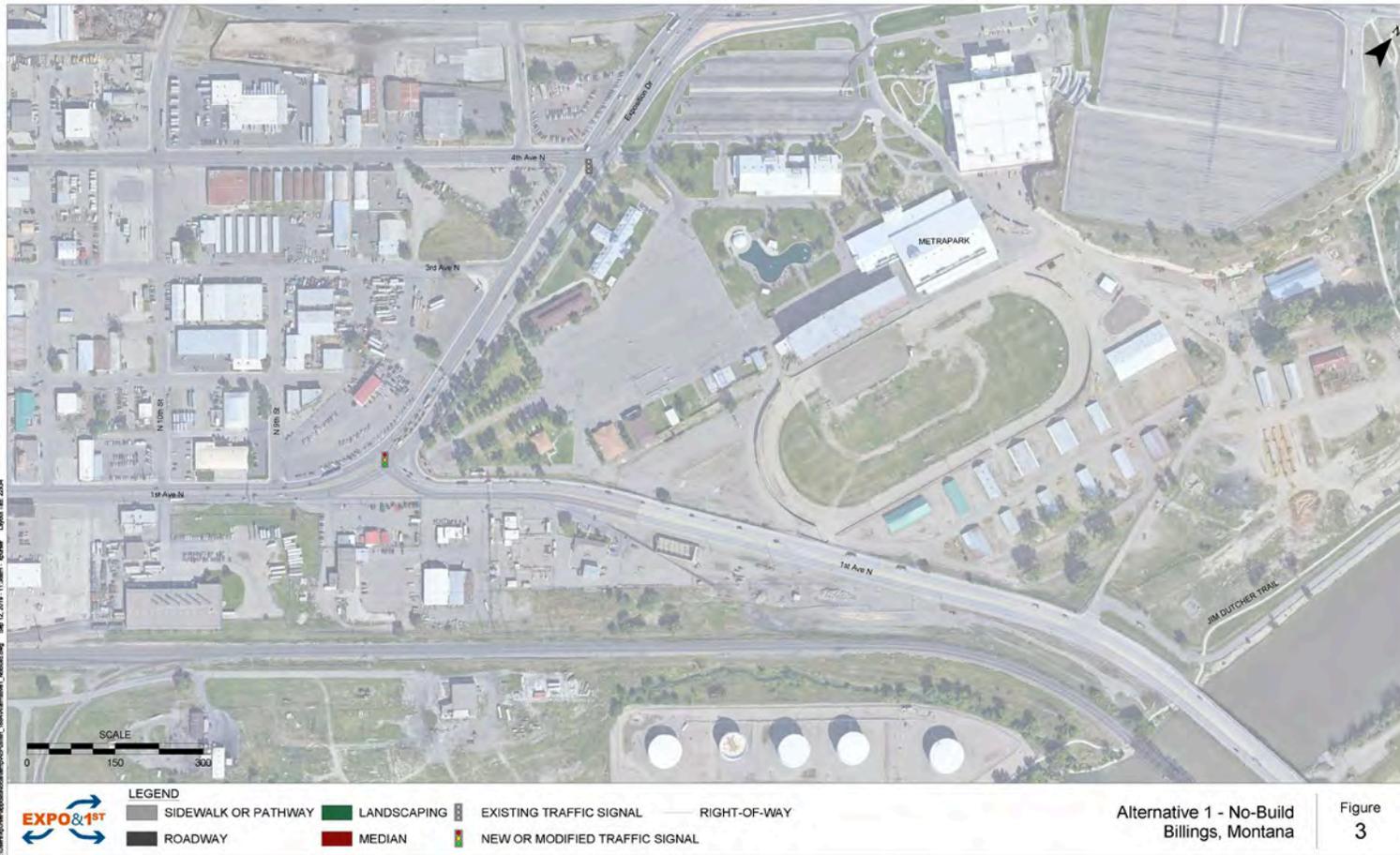


We are here!

- Started with a range of options (~16)
 - Selected six alternatives for Tier 1
- Tier 1
 - Evaluate six alternatives
 - Select two alternatives for Tier 2 evaluation



Alternative 1 No-Build

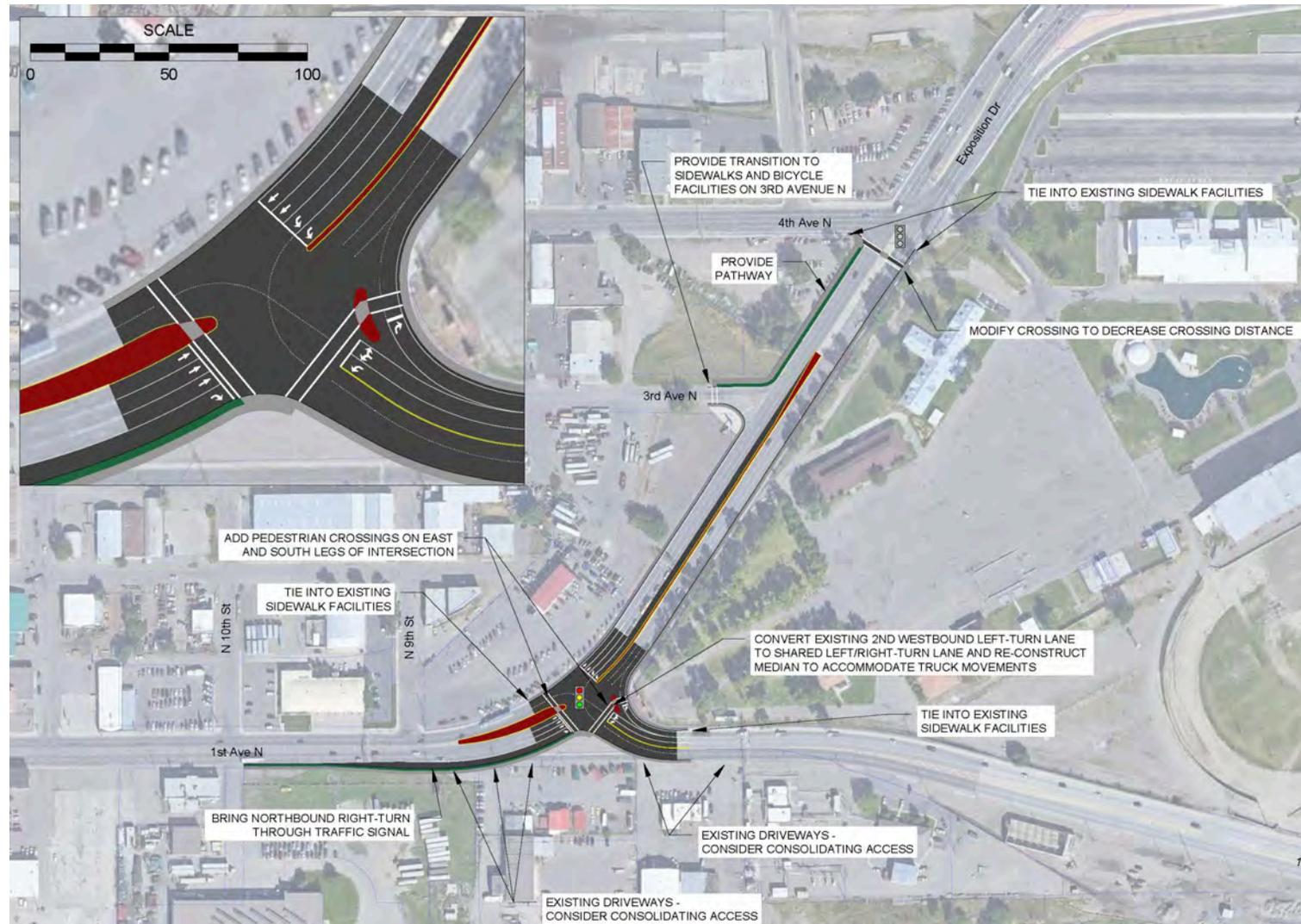


- Does not fix the problem
- Used to compare alternatives



Alternative 2

Westbound Shared Left/Right-Turn Lane

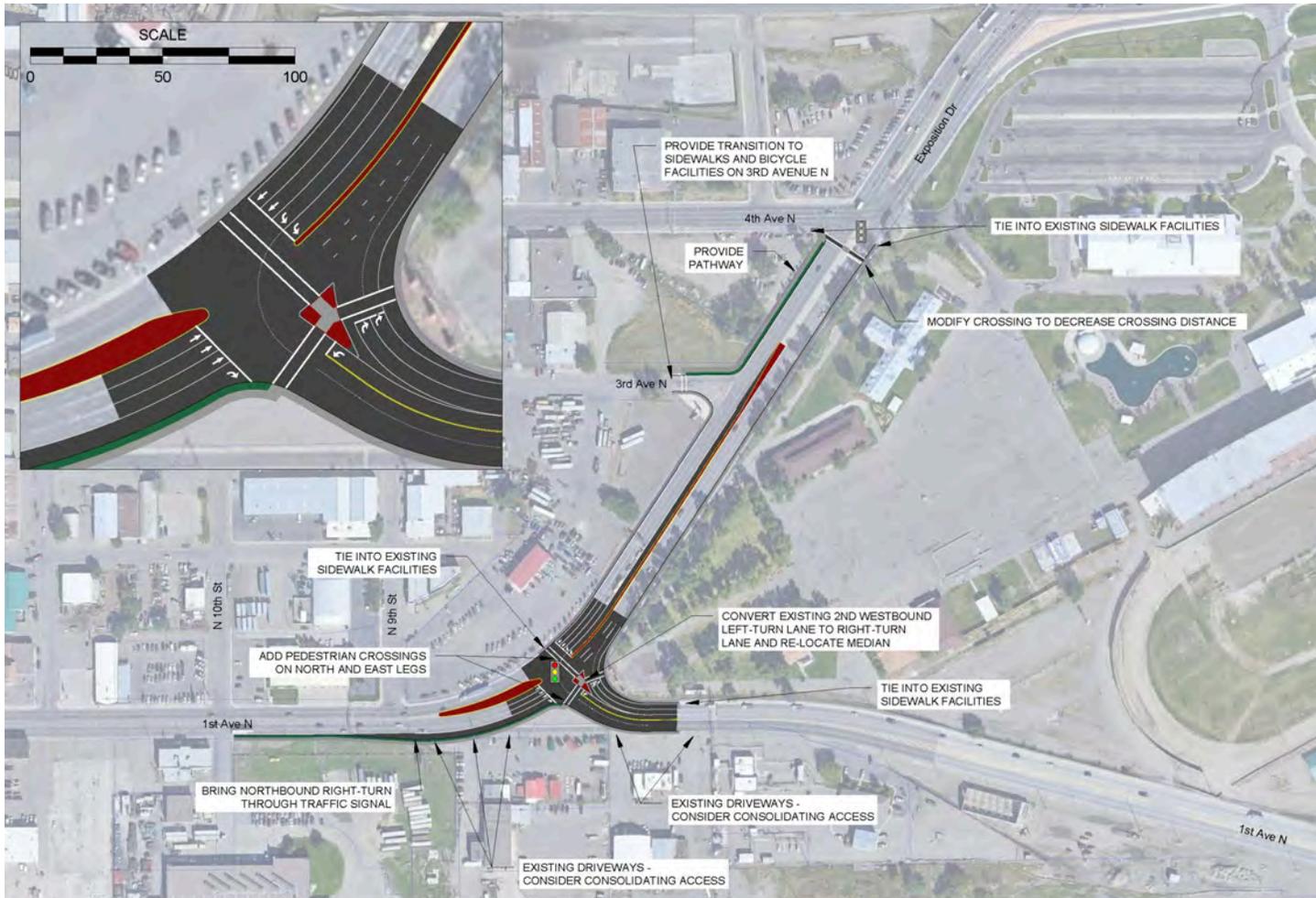


- Modify westbound approach
 - Left-turn lane
 - Shared left/right-turn lane
 - Right-turn lane
- Modify northbound right-turn lane
- Add crossings, pathway, and detached sidewalks



Alternative 3

Single Westbound Left-Turn Lane and Dual Westbound Right-Turn Lanes

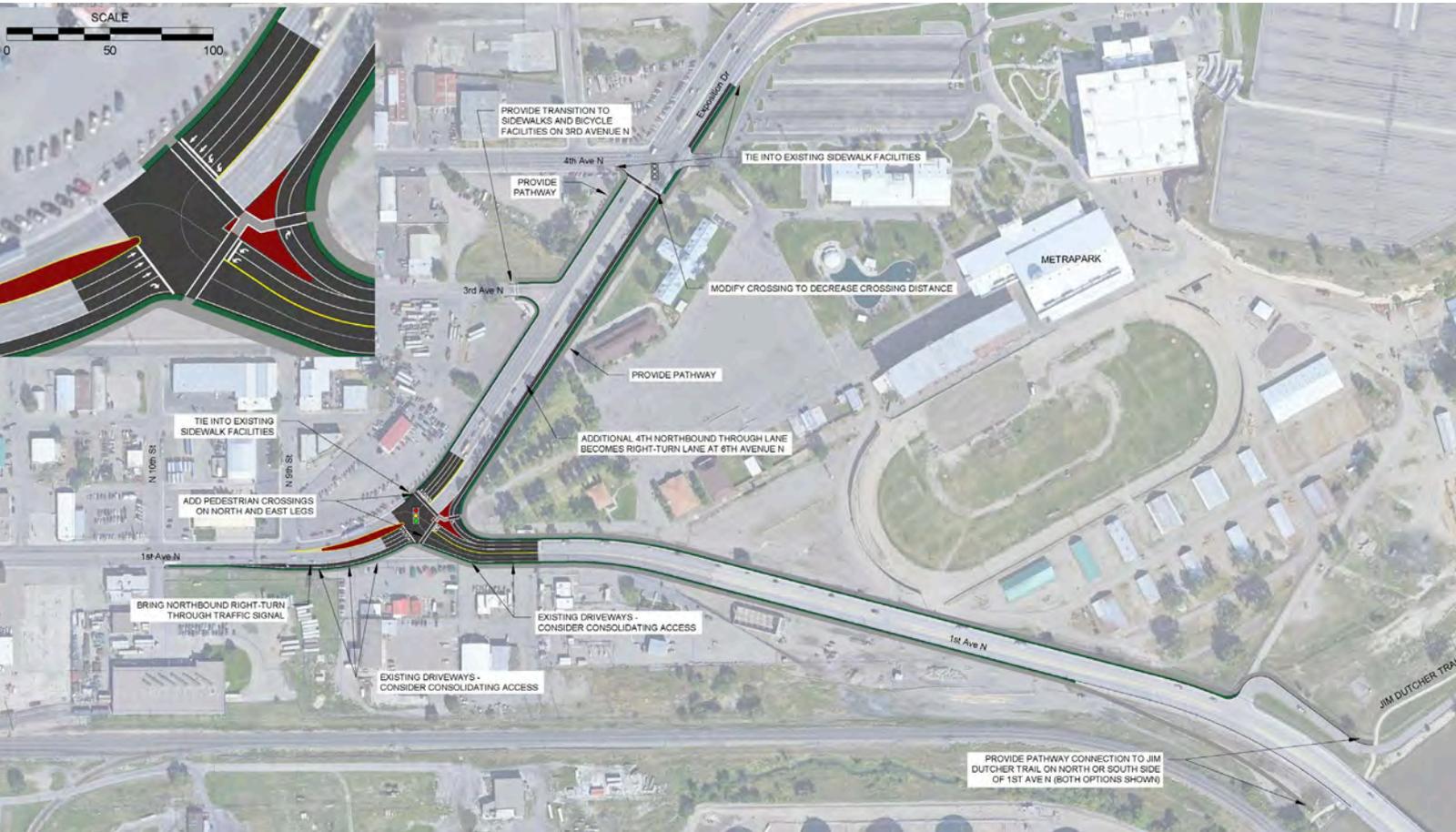


- Modify westbound approach
 - Left-turn lane
 - Dual right-turn lanes
- Modify northbound right-turn lane
- Add crossings, pathway, and detached sidewalks



Alternative 4

Free Westbound Right-Turn Lane

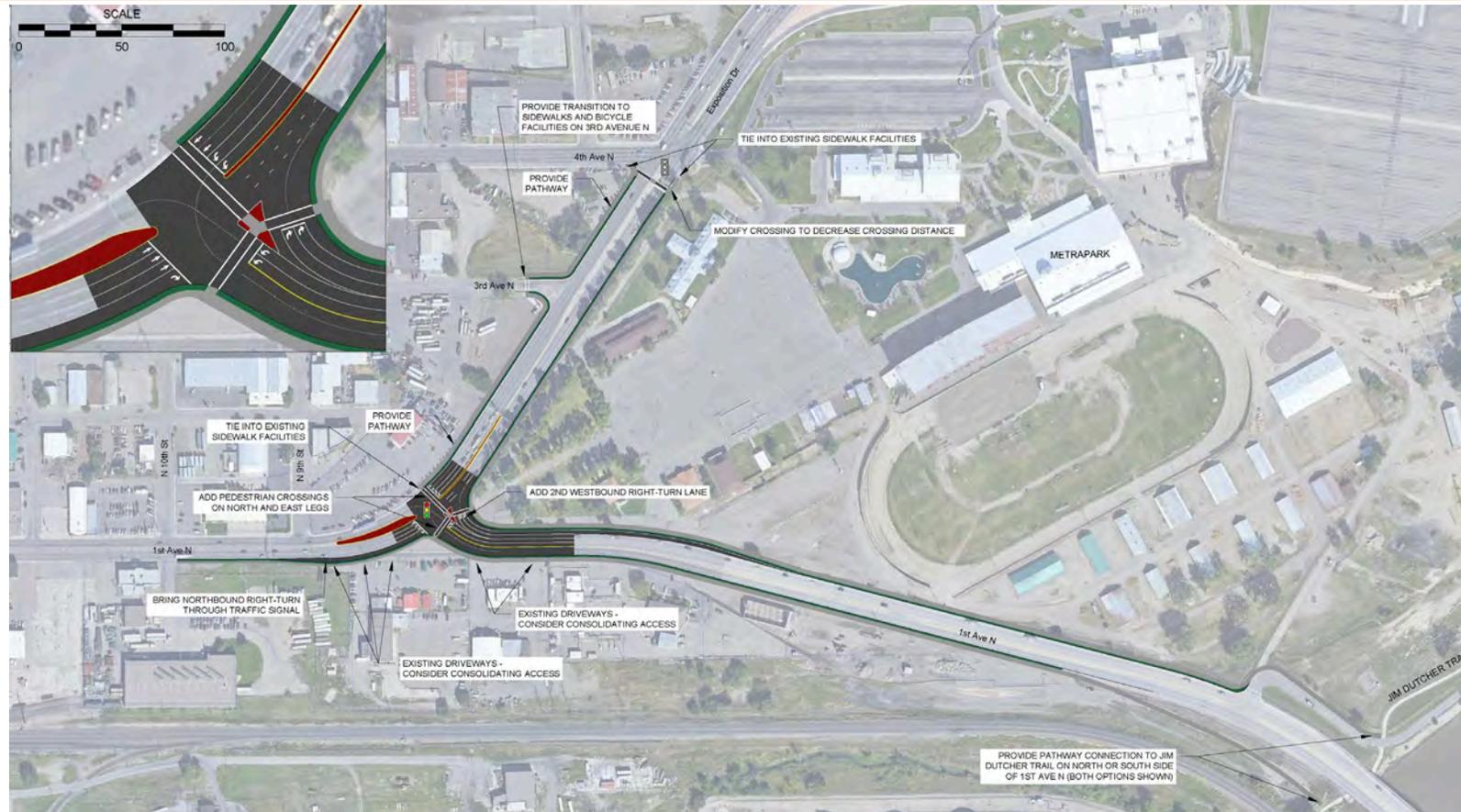


- Modify westbound approach
 - Dual left-turn lanes
 - Single right-turn lane (signalized)
- Add 4th northbound through lane to Bench Blvd
- Modify northbound right-turn lane
- Add crossings, pathway, and detached sidewalks



Alternative 5

Dual Westbound Right-Turn Lanes

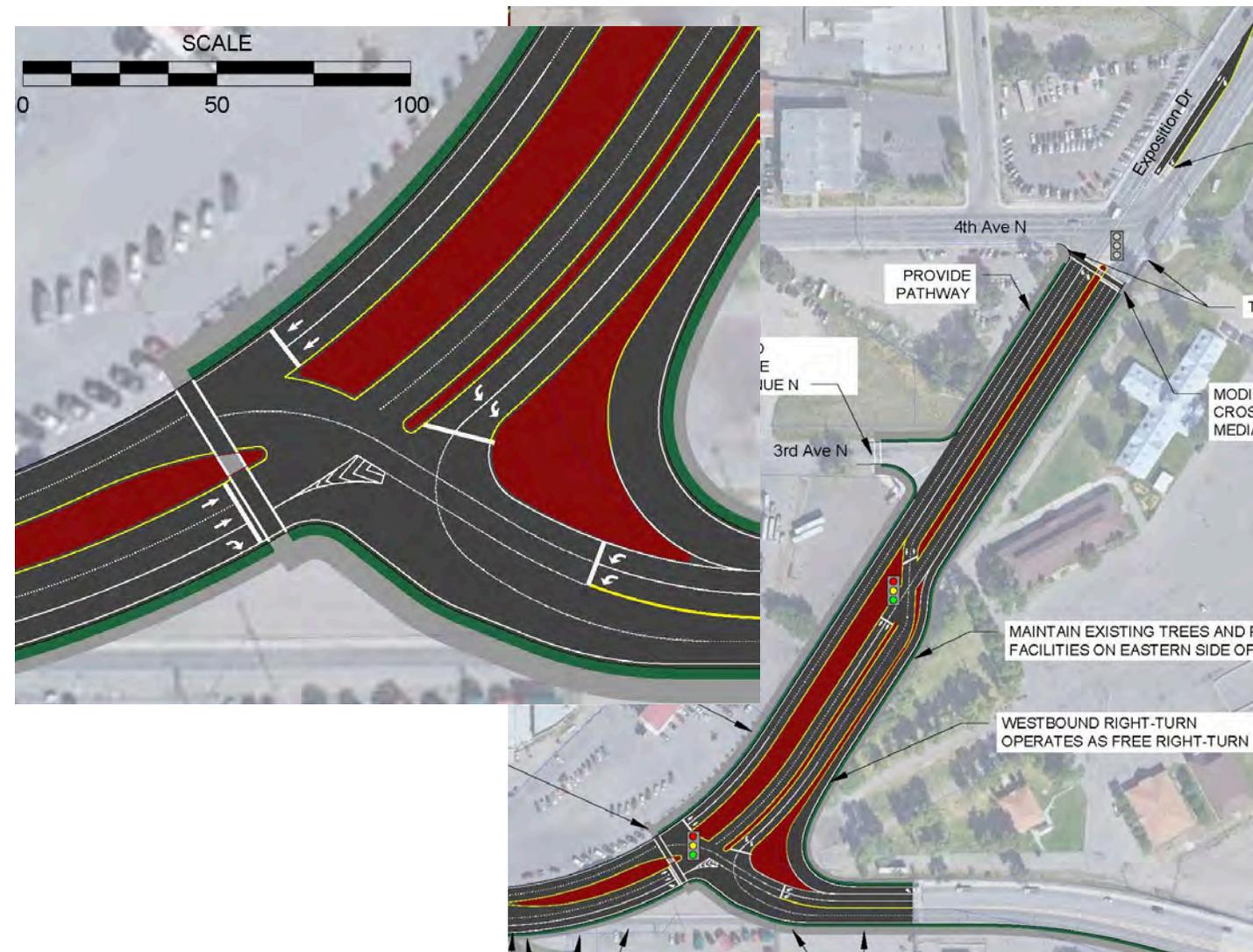


- Modify westbound approach
 - Dual left-turn lanes
 - Dual right-turn lane (signalized)
- Modify northbound right-turn lane
- Add crossings, pathway, and detached sidewalks



Alternative 6

Partial Displaced Left-Turn



- Modify intersection for southbound left-turn lanes
- Add free westbound right-turn lane
- Modify northbound right-turn lane
- Add crossings, pathway, and detached sidewalks





Tier 1 Evaluation Criteria and Results



Evaluation Results

Criteria	Alt 1 NB	Alt 2 Shared L/R	Alt 3 L/R/R	Alt 4 Free RT	Alt 5 Dual RT	Alt 6 DLT
Safety Performance	Lower	Medium	Medium	Medium	Medium	Medium
Number of Free Right-Turns	1	0	0	1	0	1
Pedestrian Facility Quality	Lower	Medium	Medium	Higher	Higher	Med-to-High
Bicycle Facility Quality	Lower	Medium	Medium	Higher	Higher	Med-to-High
Traffic Operations (2040 AM/PM Peak Hour Level of Service)	C/E	C/E	C/E	C/D	C/D	B/B
Traffic Operations Lifespan (After 2040)	0 years	0 years	0 years	8-12 years	8-12 years	16-20 years
Right-Of-Way Impact	None	Lower	Low-to-Med	Med-to-High	Medium	Higher
Number of Properties Impacted	0	7	8	13	13	13
Design and Construction Cost Estimates	None	Lower	Lower	Medium	Medium	Higher





Breakout Session – Let's Hear From You!





Next Steps



Next Steps

- PAC action—Return comment sheet by Sept 30th
- Technical team will...
 - post materials to project website: <https://www.mdt.mt.gov/pubinvolve/expofirst/>
 - evaluate Tier 2 Alternatives
 - continue to meet with business/property owners
 - prepare for open house
- Next PAC Meeting:
 - December (TBD)
 - Results from Tier 2 Analysis
 - Confirm Final Alternative

